USER MANUAL

BE-0961

3.5" SBC with Intel® Celeron® / Atom™ SoC on Top Side (Baytrail-M/I) / Dual LAN

BE-0961 M5

BE-0961

3.5” Single Board Computer

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DISCLAIMER
This user’s manual is meant to assist users in installing and setting up the system. The information contained in this document is subject to change without any notice.

CE NOTICE
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

	CAUTION: Danger of explosion may occur when the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

	WARNING: Some internal parts of the system may have high electrical voltage. We strongly recommend that only qualified engineers are allowed to service and disassemble the system. If any damages should occur on the system and are caused by unauthorized servicing, it will not be covered by the product warranty.

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1 Introduction

This chapter provides the introduction for the BE-0961 system as well as the framework of the user manual.

The following topics are included:

- About This Manual

1.1 About This Manual

Thank you for purchasing our BE-0961 with Intel® 4th Gen. Atom™ E3000/N2000 SBC enhanced with VGA/Audio/2LAN/4COM, which is fully PC/AT compatible. The BE-0961 provides faster processing speed, greater expandability and can handle more tasks than before. This manual is designed to assist you how to install and set up the system. It contains four chapters. Users can apply this manual for configuration according to the following chapters:

The following section describes the structure of this user manual.

Chapter 1 Introduction
This chapter introduces the system as well as the framework of this user manual.

Chapter 2 Getting Started
This chapter describes the package contents and system specifications.

Chapter 3 Hardware Configuration
This chapter describes the locations and functions of the motherboard components. You will learn how to properly configure the connectors and configuration jumpers on the motherboard and configure the motherboard to meet your own needs.

Chapter 4 Software Utilities
This chapter indicates you how to set up the BIOS configurations.

Chapter 5 AMI BIOS Setup
This chapter provides BIOS setup information.

Appendix A Expansion Bus
This appendix introduces you the expansion bus for a CFast slot.

Appendix B Technical Summary

This appendix gives you the information about the Technical maps, Flash BIOS Update and the Watchdog-timer configuration.

2 Getting Started

This chapter provides the information for the BE-0961 system. It describes the package contents and outlines the system specifications.

The following topics are included:

- Package List
- System Specification
- Safety Precautions

Experienced users can go to Chapter 3 System Configuration on page 3-1 for a quick start.

2.1 Packing List

If you discover any of the items listed above are damaged or lost, please contact your local distributor immediately.

Item	Q'ty
BE-0961	1
Quick Reference Guide	1
Manual / Driver DVD	1
Mini Jumper (2.0 mm)	6
SATA & SATA Power Y-type Cable (150mm)	1
DC In Power Cable (200mm)	1

2.2 BE-0961 Specifications

- General temperature SKU:

Model	BE-0961RC-30N	BE-0961RC-07N	BE-0961RC-M0N	BE-0961RC-M7N
Operating Temp.	➢ -0°~60°C w/ heatsink			
Humidity	➢ Operating/Storage humidity 20~95%			
Storage Temp.	➢ -40° C ~85°C			
RoHS	➢ RoHS Version.			
Dimensions	➢ 3.5" SBC Platform, 102mm x 145mm, 1.6mm PCB thickness			
CPU	Celeron N2930 (Baytrail-M)	Celeron N2807 (Baytrail -M)	Celeron N2930 (Baytrail -M)	Celeron N2807 (Baytrail -M)
SATA	1 x SATA II port		N/A	
Expansion Slot/mSATA/ SATA	➢ 1 x half-sized mPCIe (on bottom side)		➢ 1 x half-sized mSATA (on bottom side)	
CFast	➢ 1 x CFast Slot (on bottom side) ➢ Voltage level is selected by jumper (Default: 3.3V)			
PCH	➢ N/A (integrated in SoC)			
BIOS	➢ AMI UEFI BIOS			
OS Support list	➢ Windows 10 32/64bit ➢ Windows 8.1 32bit/64bit ➢ Windows 7 32/64 bit ➢ Ubuntu 14.04 32/64bit			
Memory Support	➢ 1x SO-DIMM socket, supporting 1066/1333 DDR3L memory up to 8G (non-ECC) (on bottom side)			
Display	➢ 1x VGA (Rear I/O), resolution: up to 1920x1200@60Hz ➢ 1x LVDS (Internal connector), Dual Channel, 24-bit, resolution are set by customized BOM selection ➢ LVDS connector supports LVDS_VCC 3.3V/5V selectable by jumper (Default: 3.3V)			
LVDS Backlight	➢ JINV 6-pin connector supports 12V,BLEN, PWM for panel backlight power/enable/dimming: ➢ PWM's voltage level is fixed to 3.3V ➢ PWM's duty cycle can be controlled by Windows built-in APP ➢ BLEN pin is obtained directly by CH7511			
LAN	➢ Dual LAN (2xRJ45 on Rear I/O) ➢ Supports Wake-On-LAN ➢ Controller : 2 x Intel I210-IT (MAC+PHY, PCIe interface)			

Sound	➢ Line In / Line Out / Mic In (onboard pin header) ➢ Codec IC: Realtek ALC888 (High Definition Codec)
USB Ports	**3 USB ports:** ➢ 1 x USB 2.0 (Rear I/O) ➢ 1 x USB 3.0 (Rear I/O) ➢ 1 x USB 2.0 (internal pin header)
Serial Ports	**4 COM ports (internal pin header):** ➢ COM1: RS-232 ➢ COM2: RS-232/422/485, selected by Jumper ➢ COM3: RS-232 w/ 5V/12V/RI selectable by jumper ➢ COM4: RS-232 w/ 5V/12V/RI selectable by jumper
Digital I/O	➢ 4bit DI / 4 bit DO 8 bit (internal pin header) ➢ DIO Pin header provides 5V power pin / GND pin
Front Panel	➢ 2x5 Pin header: HDD LED / PWR LED / RST BTN / PWR BTN
Buzzer	➢ N/A
Other Function	➢ 1 x 3-pin CPU FAN connector
Power Supply	➢ Supports only DC 12V power input (1x 4 pin power connector)

- Wide temperature SKU:

Wide temperature SKU: Model	BE-0961RC-W1N	BE-0961RC-W2N	BE-0961RC-E1N	BE-0961RC-E2N
Operating Temp.	-30°e~85°C w/ heatsink	-40°~85°C w/ heatsink	-30°~85°C w/ heatsink	-40°~85°C w/ heatsink
Humidity	➢ Operating / Storage humidity 20~95%			
Storage Temp.	➢ -40°~85°C			
RoHS	➢ RoHS Version.			
Dimensions	➢ 3.5" SBC Platform, 102mm x 145mm, 1.6mm PCB thickness			
CPU	Atom E3815 (Baytrail-M)	Atom E3825 (Baytrail -M)	Atom E3815 (Baytrail -M)	Atom E3825 (Baytrail -M)
SATA	1 x SATA II port		N/A	
Expansion Slot/mSATA/SATA	➢ 1 x half-sized mPCIe (on bottom side)		➢ 1 x half-sized mSATA (on bottom side)	
CFast	➢ 1 x CFast Slot (on bottom side) ➢ Voltage level is selected by jumper (Default: 3.3V)			
PCH	➢ N/A (integrated in SoC)			
BIOS	➢ AMI UEFI BIOS			
OS Support list	➢ Windows 10 32/64bit ➢ Windows 8.1 32bit/64bit ➢ Windows 7 32/64 bit ➢ Ubuntu 14.04 32/64bit			
Memory Support	➢ 1x SO-DIMM socket, supporting 1066/1333 DDR3L memory up to 8G (non-ECC) (on bottom side)			
Display	➢ 1x VGA(Rear I/O), resolution: up to 1920x1200@60Hz ➢ 1x LVDS(Internal connector), Dual Channel, 24-bit, resolution are set by customized BOM selection, ➢ LVDS connector supports LVDS_VCC 3.3V/5V selectable by jumper (Default: 3.3V)			
LVDS Backlight	➢ JINV 6-pin connector supports 12V,BLEN, PWM for panel backlight power/enable/dimming: ➢ PWM's voltage level is fixed to 3.3V ➢ PWM's duty cycle can be controlled by Windows built-in APP ➢ BLEN pin is obtained directly by CH7511			
LAN	➢ Dual LAN (2xRJ45 on Rear I/O) ➢ Supports Wake-On-LAN ➢ Controller : 2 x Intel I210-IT (MAC+PHY, PCIe interface)			
Sound	➢ Line-in / Line-out / MIC-in (onboard pin header) ➢ Codec IC: Realtek ALC888 (High Definition Codec)			

USB Ports	**3 USB ports:** ➢ 1 x USB 2.0 (Rear I/O) ➢ 1 x USB 3.0 (Rear I/O) ➢ 1 x USB 2.0 (internal pin header)
Serial Ports	**4 COM ports (internal pin header):** ➢ COM1: RS232 ➢ COM2: RS232/422/485, selected by Jumper ➢ COM3: RS232 w/ 5V/12V/RI selectable by jumper ➢ COM4: RS232 w/ 5V/12V/RI selectable by jumper
Digital I/O	➢ 4bit DI / 4 bit DO 8 bit (internal pin header) ➢ DIO Pin header provides 5V power pin / GND pin
Front Panel	➢ 2x5 Pin header: HDD LED / PWR LED / RST BTN / PWR BTN
Buzzer	➢ N/A
Other Function	➢ 1 x 3-pin CPU FAN connector
Power Supply	➢ Supports only DC 12V power input (1x 4 pin power connector)
Power Mode	➢ ATX mode: (default) ➢ Boot-up when AC returns back ➢ Auto boot-up when AC returns back (default) ➢ Non-auto boot-up when AC returns back (selected by jumper) ➢ Way to Boot-Up from S5: (1)Power Button (2)Wake-On-LAN ➢ Way to shut down to S5/S4/S3: (1) Power button (2) OS command ➢ Supports S0/S3/S4/S5
Battery	➢ 2-pin wafer, connected with a cable type BAT

2.3 Safety Precautions

Follow the instructions below to avoid your system from damages:

1. Keep your system away from static electricity on all occasions.
2. Prevent electric shock. Don't touch any components of this board when it is powered on. Always disconnect power when the system is not in use.
3. Disconnect power source when you change any hardware devices.
   For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

3 Hardware Configuration

This chapter contains helpful information about the jumper & connector settings and component locations.

The following sections are included:

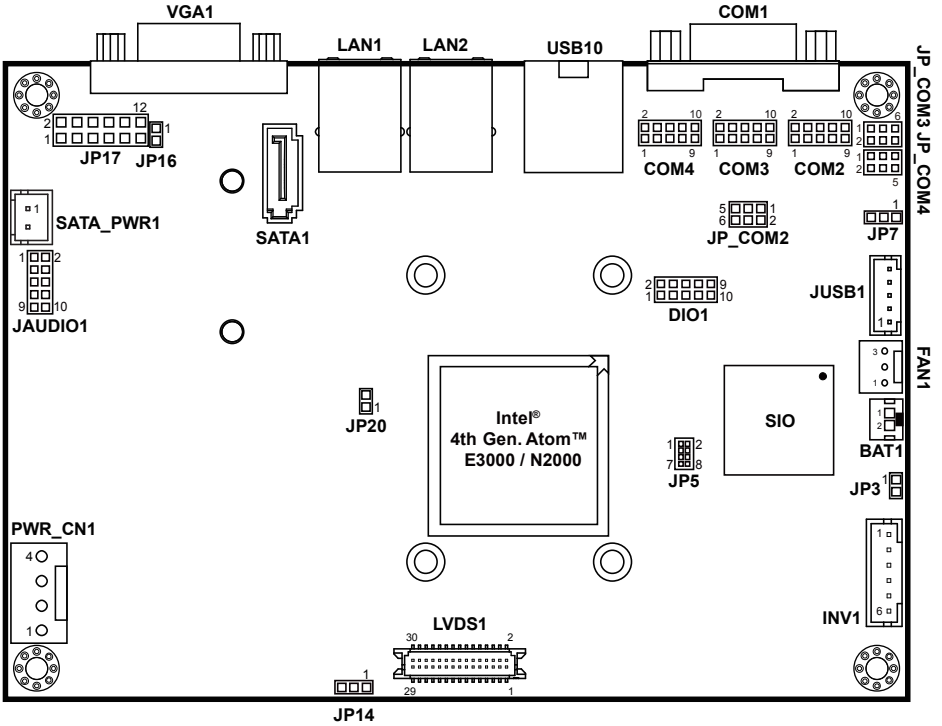
- Jumper & Connector Quick Reference Table
- Main Board Component Locations
- Configuration and Jumper Settings
- Connector Pin Assignments

3.1 JUMPER & CONNECTOR QUICK REFERENCE TABLE

JUMPER / CONNECTOR	NAME
COM Port	COM1, COM2, COM3, COM4
COM2 RS-232/422/485 Selection	JP_COM2
COM3 & COM4 RI & Voltage Selection	JP_COM3, JP_COM4
USB Port & Connector	USB10, JUSB1
LAN Port	LAN1/LAN2
VGA Port	VGA1
Clear CMOS Data Selection	JP3
AT/ATX Power Mode Selection	JP16
Panel Voltage Selection	JP14
Front Panel Selection	JP17
Power Connector	PWR_CN1
SATA Connector	SATA1
SATA Power Connector	SATA_PWR1
Digital I/O Connector	DIO1
Audio Connector	JAUDIO1
System Fan Connector	FAN1
Backlight Connector	INV1
Battery Connector	BAT1
CFAST Voltage Selection	JP7
LVDS Connector	LVDS1

3.2 COMPONENT LOCATIONS OF SYSTEM MAIN BOARD

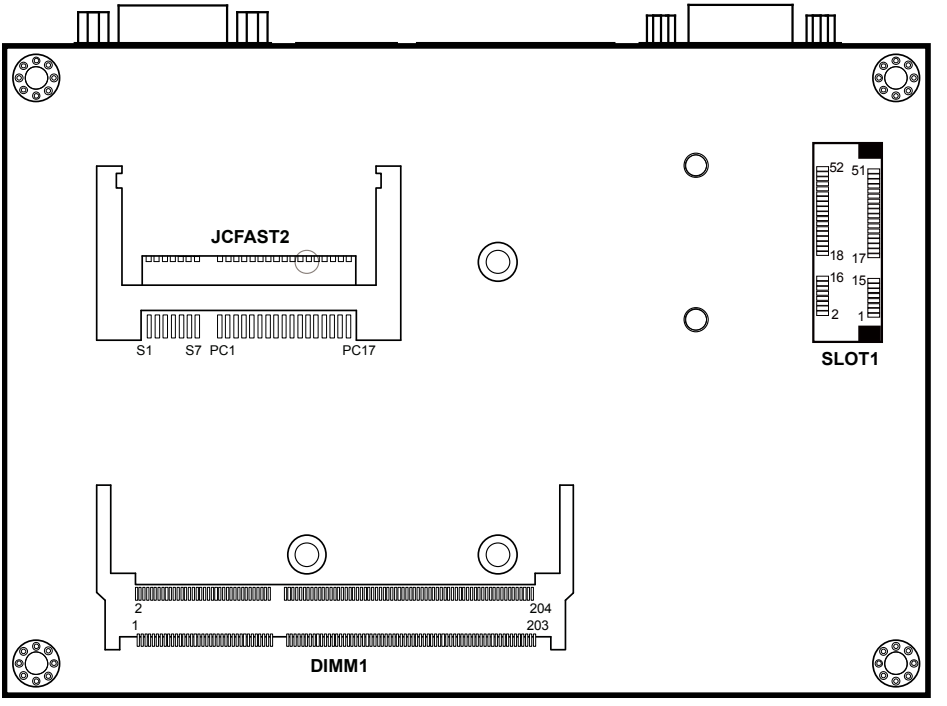
3.2.1 Top View of BE-0961



	WARNING: Always disconnect the power cord when you are working with connectors and jumpers on the main board. Make sure both the system and peripheral devices are turned OFF as sudden surge of power could damage sensitive components. Make sure BE-0961 is properly grounded.
	CAUTION: Observe precautions while handling electrostatic sensitive components. Make sure to ground yourself to prevent static charge while you are working on the connectors and jumpers. Use a grounding wrist strap and place all electronic components in any static-shielded devices.

CAUTION: Always touch the motherboard components by the edges. Never touch components such as a processor by its pins. Take special cares while you are holding electronic circuit boards by the edges only. Do not touch the main board components.

3.2.2 Bottom View of BE-0961

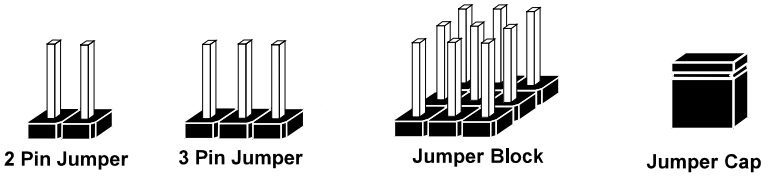


3.3 HOW TO SET JUMPERS

You can configure your board by setting jumpers. Jumper is consists of two or three metal pins with a plastic base mounted on the card, and by using a small plastic "cap", Also known as the jumper cap (with a metal contact inside), you are able to connect the pins. So you can set-up your hardware configuration by "open" or "close" pins.

The jumper can be combined into sets that called jumper blocks. When the jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows how this looks like.

JUMPERS AND CAPS

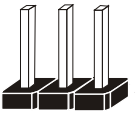


If a jumper has three pins (for examples, labeled PIN1, PIN2, and PIN3), you can connect PIN1 & PIN2 to create one setting by shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.

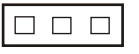
Jumper Diagrams

Jumper Cap looks like this

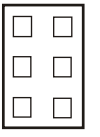
2 pin Jumper looks like this



3 pin Jumper looks like this

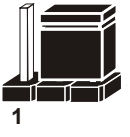


Jumper Block looks like this

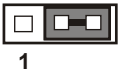


Jumper Settings

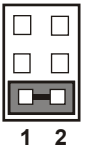
2 pin Jumper close(enabled) Looks like this



3 pin Jumper 2-3 pin close(enabled) Looks like this



Jumper Block 1-2 pin close(enabled) Looks like this



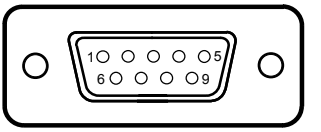
3.4 Setting Connectors and Jumpers

3.4.1 COM PORT (COM1 ~ COM4)

COM1~COM4: COM Connectors, all are fixed as RS-232
The pin assignments are as follows:

COM1:

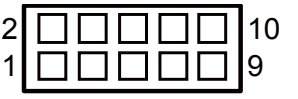
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND	-	-



COM1

COM2(RS-232) Connector Pin Assignment:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	COM2_DCD	6	COM2_DSR
2	COM2_RX	7	COM2_RTS
3	COM2_TX	8	COM2_CTS
4	COM2_DTR	9	COM2_RI
5	GND	10	NC



COM2

COM2(RS-422) Connector Pin Assignment:

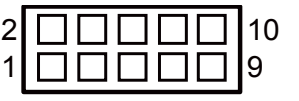
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	TX-	6	NC
2	TX+	7	NC
3	RX-	8	NC
4	RX+	9	NC
5	GND	10	NC

COM2(RS485) Connector Pin Assignment:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	D-	6	NC
2	D+	7	NC
3	NC	8	NC
4	NC	9	NC
5	GND	10	NC

COM3, COM4:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD	6	CTS
2	DSR	7	DTR
3	RXD	8	RI
4	RTS	9	GND
5	TXD	10	NC



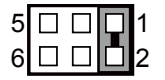
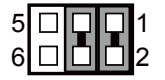
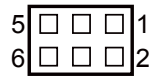
COM3/

COM4

3.4.2 COM2 RS-232/422/485 SELECTION (JP_COM2)

Jumper Location: JP_COM2

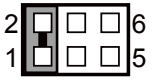
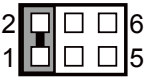
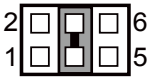
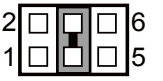
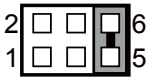
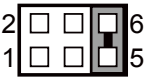
Description: COM2 RS-232/422/485 Selection connector, used to set COM2 function.

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
RS-232	**1-2** ***(Default Setting)***	 **JP_COM2**
RS-422	1-2, 3-4	 **JP_COM2**
RS-485	Open	 **JP_COM2**

3.4.3 COM3 & COM4 RI & VOLTAGE SELECTION (JP_COM3, JP_COM4)

Jumper Location: JP_COM3, JP_COM4

Description: COM3 & COM4 RI & Voltage Selection connectors, used to set COM3 & COM4 function.

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION	
		COM3	COM4
RI	**1-2** ***(Default Setting)***	 **JP_COM3**	 **JP_COM4**
12V	3-4	 **JP_COM3**	 **JP_COM4**
5V	5-6	 **JP_COM3**	 **JP_COM4**

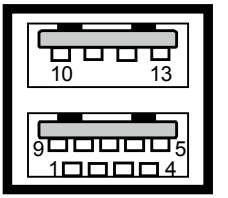
3.4.4 USB PORT & CONNECTOR (USB10, JUSB1)

Port Location: USB10
Description: USB Ports

The pin assignments are as follows:

USB3.0 signal:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC5	6	RX1_DP
2	USBP1N	7	GND
3	USBP1P	8	TX1_DN
4	GND	9	TX1_DP
5	RX1_DN	-	-



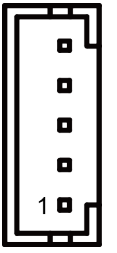
USB10

USB2.0 signal:

PIN	ASSIGNMENT
10	VCC5
11	USBP2N
12	USBP2P
13	GND

Connector Location: JUSB1
Description: USB Connector

PIN	ASSIGNMENT
1	D-
2	D+
3	GND
4	VCC5
5	GND



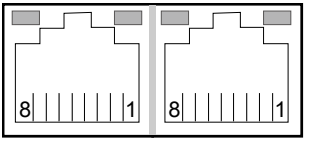
JUSB1

3.4.5 LAN PORT (LAN1, LAN2)

Port Location: LAN1, LAN2
Description: LAN Ports

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	LAN1_MDI_P0	5	LAN1_MDI_N2
2	LAN1_MDI_N0	6	LAN1_MDI_N1
3	LAN1_MDI_P1	7	LAN1_MDI_P3
4	LAN1_MDI_P2	8	LAN1_MDI_N3

Yellow Green Yellow Green



LAN1 / LAN2

LAN LED Indicator:

Left Side LED

Green Color ON	100 LAN Speed Indicator
Orange Color ON	Giga LAN Speed Indicator
OFF	10 LAN Speed Indicator

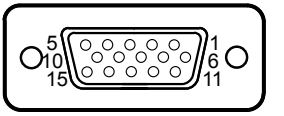
Right Side LED

Yellow Color Blinking	LAN Message Active
Yellow Color ON	LAN Switch/Hub connected
OFF	No LAN Switch/Hub connected

3.4.6 VGA PORT (VGA1)

Port Location: VGA1
Description: VGA Port

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	DDCA DATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDCA CLK
8	GND	-	-



VGA1

3.4.7 CLEAR CMOS DATA SELECTION (JP3)

Jumper Location: JP3
Description: Clear CMOS Data Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Normal	**Open** *(Default Setting)*	**JP3**
Clear CMOS*	1-2	**JP3**

*To clear CMOS data, user must power-off the computer and set the jumper to "Clear CMOS" as illustrated above. After five to six seconds, set the jumper back to "Normal" and power on the computer.

3.4.8 Auto boot-up after AC returns from power-loss (JP16)

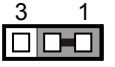
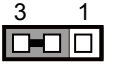
Jumper Location: JP16
Description: Auto boot-up / keep S5 selection

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
Auto boot-up	Close	**JP16**
Keep on S5	Open	**JP16**

Note: Manufacturing Default is ATX.

3.4.9 LVDS VCC VOLTAGE SELECTION (JP14)

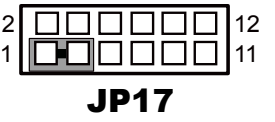
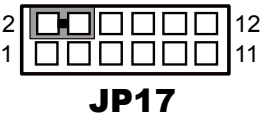
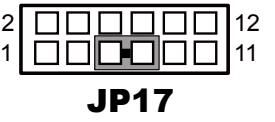
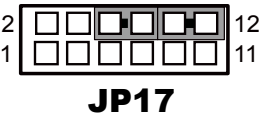
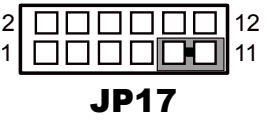
Jumper Location: JP14
Description: LVDS VCC Voltage Selection

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
3.3V	***1-2 (Default Setting)***	 **JP14**
5V	2-3	 **JP14**

3.4.10 FRONT PANEL SELECTION (JP17)

Jumper Location: JP17

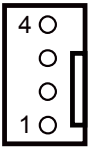
Description: Front Panel Selection

SELECTION	PIN & ASSIGNMENT	JUMPER SETTINGS	JUMPER ILLUSTRATION
HDD LED	1. HDD_LED+	1-3	
	3. HDD_LED-		
Power LED	2. PWR_LED+	2-4	
	4. PWR_LED-		
Reset Button	5. RSTSW-	5-7	
	7. RSTSW+		
External Speaker	6. SPEAKER+	6-8-10-12	
	8. SPEAKER-		
	10. SPEAKER-		
	12. SPEAKER-		
ATX Power Button	9. PWRSW+	9-11	
	11. PWRSW-		

3.4.11 POWER CONNECTOR (PWR_CN1)

Connector Location: PWR_CN1
Description: Power Connector

PIN	ASSIGNMENT
1	VCC12
2	VCC12
3	GND
4	GND

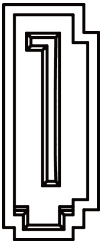


PWR_CN1

3.4.12 SATA & SATA POWER CONNECTOR (SATA1, SATA_PWR1)

Port Location: SATA1
Description: SATA Port

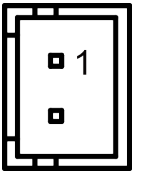
PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	5	RX_N_C
2	TX_P_C	6	RX_P_C
3	TX_N_C	7	GND
4	GND	-	-



SATA1

Port Location: SATA_PWR1
Description: SATA Power Connector

PIN	ASSIGNMENT
1	VCC5
2	GND



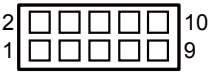
SATA_PWR1

3.4.13 DIGITAL I/O CONNECTOR (DIO1)

Connector Location: DIO1

Description: Digital Input / Output Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC5	6	Digital output 2
2	GND	7	Digital input 3
3	Digital input 1	8	Digital output 3
4	Digital output 1	9	Digital input 4
5	Digital input 2	10	Digital output 4



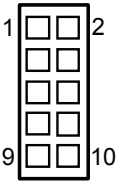
DIO1

3.4.14 AUDIO CONNECTOR (JAUDIO1)

Connector Location: JAUDIO1

Description: Audio Connector, including Line In & Line Out

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	MIC-IN L	6	LINE-IN R
2	MIC-IN R	7	GND
3	GND	8	GND
4	GND	9	LINE-OUT L
5	LINE-IN L	10	LINE-OUT R



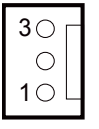
JAUDIO1

3.4.15 FAN CONNECTOR (FAN1)

Connector Location: FAN1

Description: System Fan Connector

PIN	ASSIGNMENT
1	GND
2	VCC12
3	SENCE

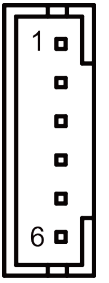


FAN1

3.4.16 BACKLIGHT CONNECTOR (INV1)

Connector Location: INV1
Description: Backlight Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC12	4	BKLTCTL
2	VCC12	5	GND
3	GND	6	BKLTEN

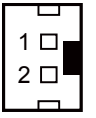


INV1

3.4.17 BATTERY CONNECTOR (BAT1)

Connector Location: BAT1
Description: Battery Connector

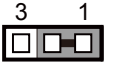
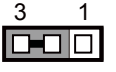
PIN	ASSIGNMENT
1	VCC3.3
2	GND



BAT1

3.4.18 CFAST VOLTAGE SELECTION (JP7)

Jumper Location: JP7
Description: CFAST Voltage Selection
The selections are as follows:

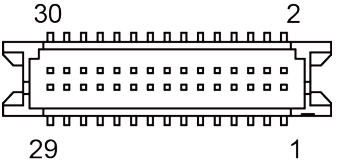
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
3.3V	***1-2 (Default Setting)***	 **JP7**
5V	2-3	 **JP7**

3.4.19 LVDS CONNECTOR (LVDS1)

Connector Location: LVDS1

Description: LVDS Connector

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	LVDS_VCC	16	LVDS_CLKAP
2	GND	17	LVDS_CLKAM
3	LVDS_CLKBM	18	GND
4	LVDS_CLKBP	19	LVDS_YAP2
5	GND	20	LVDS_YAM2
6	LVDS_YBM2	21	GND
7	LVDS_YBP2	22	LVDS_YAP1
8	GND	23	LVDS_YAM1
9	LVDS_YBM1	24	GND
10	LVDS_YBP1	25	LVDS_YAP0
11	LVDS_YBP3	26	LVDS_YAM0
12	LVDS_YBM3	27	LVDS_YAP3
13	LVDS_YBP0	28	LVDS_YAM3
14	LCDS_YBM0	29	LVDS_VCC
15	GND	30	LVDS_VCC



LVDS1

4 Software Utilities

This chapter provides the detailed information that guides users to install driver utilities for the system. The following topics are included:

- Installing Intel® Chipset Device Software Installation Utility
- Installing Intel® Trusted Execution Engine Driver Installer
- Installing USB 3.0 eXtensible Host Controller Utility
- Installing Graphics Driver Utility
- Installing LAN Driver Utility
- Installing Sound Driver Utility

4.1 Introduction

Enclosed with the BE-0961 Series package is our driver utilities contained in a DVD-ROM disk. Refer to the following table for driver locations:

Filename (Assume that DVD- ROM drive is D :)	Purpose
▪ D:\Driver\Platform\Win7(32bit)\UTILITY ▪ D:\Driver\Platform\Win7(64-bit)\UTILITY ▪ D:\Driver\Platform\Win8,Win8.1(32bit)\ UTILITY ▪ D:\Driver\Platform\Win8,Win8.1(64-bit)\ UTILITY	Intel® chipset device software installation utility
▪ D:\Driver\Platform\Win7(32-bit)\USB3 ▪ D:\Driver\Platform\Win7(64-bit)\USB3	Intel® USB 3.0 eXtensible Host Controller
▪ D:\Driver\Platform\Win7(32bit)\TXE ▪ D:\Driver\Platform\Win7(64-bit)\TXE ▪ D:\Driver\Platform\Win8,Win8.1(32bit)\ TXE ▪ D:\Driver\Platform\Win8,Win8.1(64-bit)\ TXE	Intel® Trusted Execution Engine driver installation
▪ D:\Driver\Platform\Win7(32-bit)\VGA ▪ D:\Driver\Platform\Win7(64-bit)\VGA ▪ D:\Driver\Platform\Win8,Win8.1(32bit)\ VGA ▪ D:\Driver\Platform\Win8,Win8.1(64-bit)\ VGA	Intel® Media Graphics Family for VGA driver installation
▪ D:\Driver\Platform\Win7(32-bit)\LAN ▪ D:\Driver\Platform\Win7(64-bit)\LAN ▪ D:\Driver\Platform\Win8,Win8.1(32bit)\ LAN ▪ D:\Driver\Platform\Win8,Win8.1(64-bit)\ LAN	Intel® 82583V for LAN driver installation
▪ D:\Driver\Platform\Win7(32-bit)\Sound ▪ D:\Driver\Platform\Win7(64-bit)\Sound ▪ D:\Driver\Platform\Win8,Win8.1(32bit)\ Sound ▪ D:\Driver\Platform\Win8,Win8.1(64-bit)\ Sound	Realtek ALC888S for Sound driver installation
D:\Driver\Flash BIOS	For BIOS Update Utility

Note: Be sure to install the Utility right after the OS is fully installed.

4.2 Installing Intel® Chipset Software Installation Utility

Introduction

The Intel® Chipset Device Software installs Windows INF files to the target system. These files outline to the operating system how to configure the Intel® chipset components in order to ensure that the following features function properly:

- Core PCI and ISAPNP Services
- PCIe Support
- IDE/ATA33/ATA66/ATA100 Storage Support
- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

4.3 Installation of Utility for Windows 8 / Windows 7

The Utility Pack is to be installed only for Windows 8/7 series, and it should be installed right after the OS installation. Please follow the steps below:

1. Insert the driver disk into a CD ROM device.
2. Under Windows system, go to the directory where the Utility driver is located.
3. Run the application with the Administrator privilege.

4.4 INTEL® USB3.0 EXTENSIBLE HOST CONTROLLER INSTALLATION UTILITY

Introduction

Intel® USB 3.0 eXtensible Host Controller Driver supports the following Intel® Chipsets/Processors:

- 4th Generation Intel® Core™ Processor Family
- Intel® 8 Series/C220 Series Chipset Family
- 4th Generation U-Series Platform I/O

4.5 Installation Instructions for Windows 7

1. Insert the driver disk into a CD ROM device.
2. Under Windows system, go to the directory where the driver is located.
3. Run the application with the Administrator privilege.

4.6 INTEL® TRUSTED EXECUTION ENGINE INSTALLATION UTILITY

Introduction

Pre-install Microsoft's Kernel-Mode Driver Framework (KMDF) version 1.11 for Windows 7 before you install the Intel® Trusted Execution Engine (TXE) driver in order to avoid errors in Device Manager.

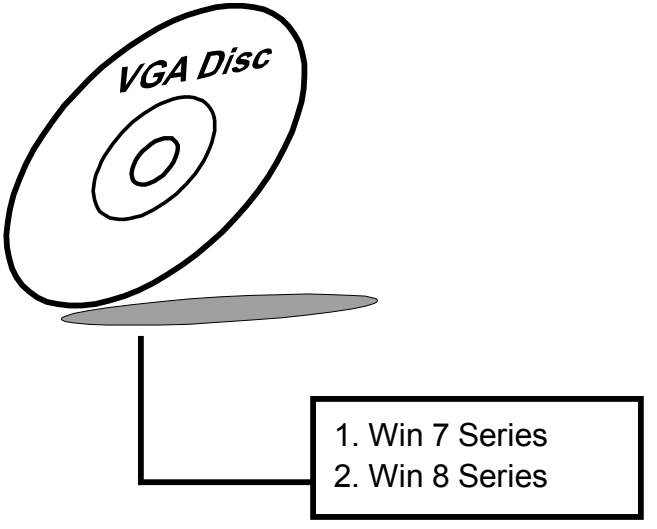
4.6.1 Installation Instructions for Windows 8 / Windows 7

1. Insert the driver disk into a CD ROM device.
2. Under Windows system, go to the directory where the driver is located.
3. Run the application with the Administrator privilege.

4.7 INSTALLATION OF VGA DRIVER UTILITY

Introduction

The VGA interface embedded with our BE-0961 can support a wide range of display. You can display CRT, LVDS simultaneously with the same mode.



To install the VGA Driver, simply follow the following steps:

1 Insert the driver disk into a CD ROM device.

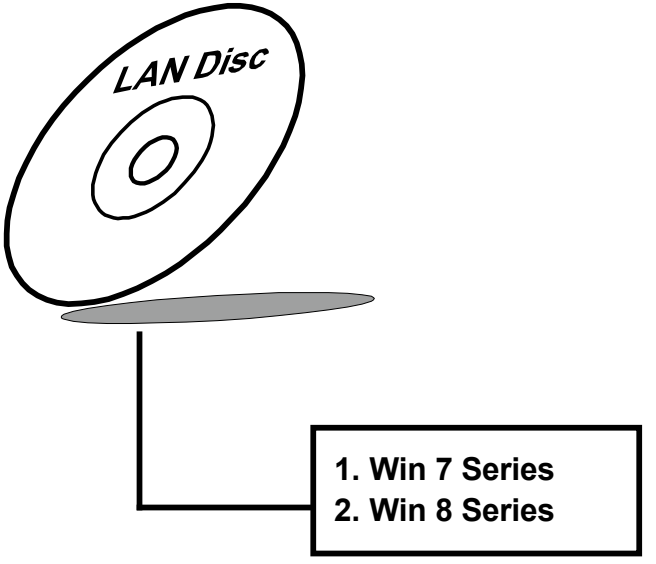
2 Under Windows system, go to the directory where the VGA driver is located.

3 Run the application with the Administrator privilege.

4.8 LAN DRIVER UTILITY

Introduction

BE-0961 is enhanced with LAN function that can support various network adapters. Installation programs for LAN drivers are listed as follows:

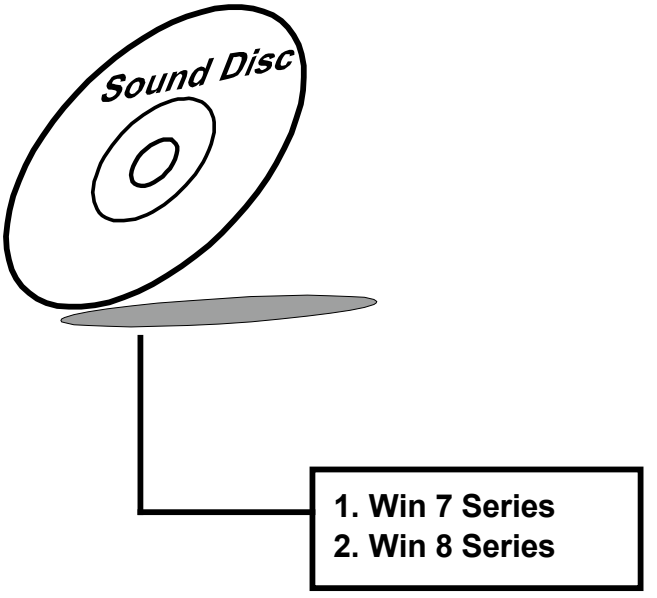


For more details on Installation procedure, please refer to Readme.txt file found on LAN Driver Utility.

4.9 SOUND DRIVER UTILITY

Introduction

The Realtek sound function enhanced in this system is fully compatible with Windows 7. Below, you will find the content of the Sound driver:



Installation of Sound Driver

1. Insert the driver disk into a CD ROM device.
2. Under Windows system, go to the directory where the Sound driver is located.
3. Run the application with administrative privileges.
4. Follow the instructions on the screen to complete the installation.
5. Once the installation is completed, shut down the system and restart in order for the changes to take effect.

5 BIOS SETUP

This chapter guides users how to configure the basic system configurations via the BIOS Setup Utilities. The information of the system configuration is saved in BIOS NVRAM so that the Setup information is retained when the system is powered off. The BIOS Setup Utilities consist of the following menu items:

- Accessing Setup Utilities
- Main Menu
- Advanced Menu
- Chipset Menu
- Security Menu
- Boot Menu
- Save & Exit Menu

5.1 Introduction

The board BE-0961 uses an AMI (American Megatrends Incorporated) Aptio BIOS that is stored in the Serial Peripheral Interface Flash Memory (SPI Flash) and can be updated. The SPI Flash contains the built-in BIOS setup program, Power-On Self-Test (POST), PCI auto-configuration utility, LAN EEPROM information, and Plug and Play support.

Aptio is AMI's BIOS firmware based on the UEFI (Unified Extensible Firmware Interface) specifications and the Intel Platform Innovation Framework for EFI. The UEFI specification defines an interface between the operating system and platform firmware. The interface consists of data tables that contain platform-related information, boot service calls, and runtime service calls that are available to the operating system and its loader. These elements have combined to provide a standard environment for booting the operating system and running pre-boot applications.

The diagram below shows the Extensible Firmware Interface's location in the software stack.

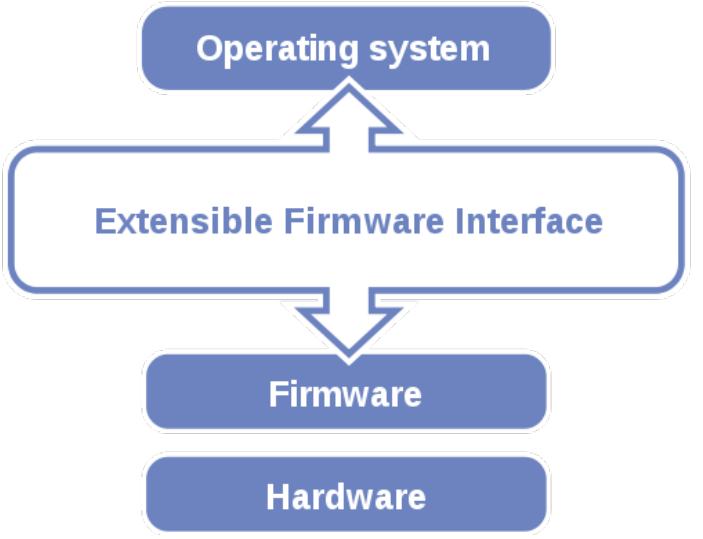


Figure 5-1. Extensible Firmware Interface Diagram

EFI BIOS provides an user interface that allows you to modify hardware configuration, e.g. change the system date and time, enable/disable a system component, determine bootable device priority, set up personal password, etc., which is convenient for engineers to perform modifications and customize the computer system and allows technicians to troubleshoot the occurred errors when the hardware is faulty.

The BIOS setup menu allows users to view and modify the BIOS settings for the computer. After the system is powered on, users can access the BIOS setup menu by pressing <Del> or <Esc> immediately while the POST message is running before the operating system is loading.

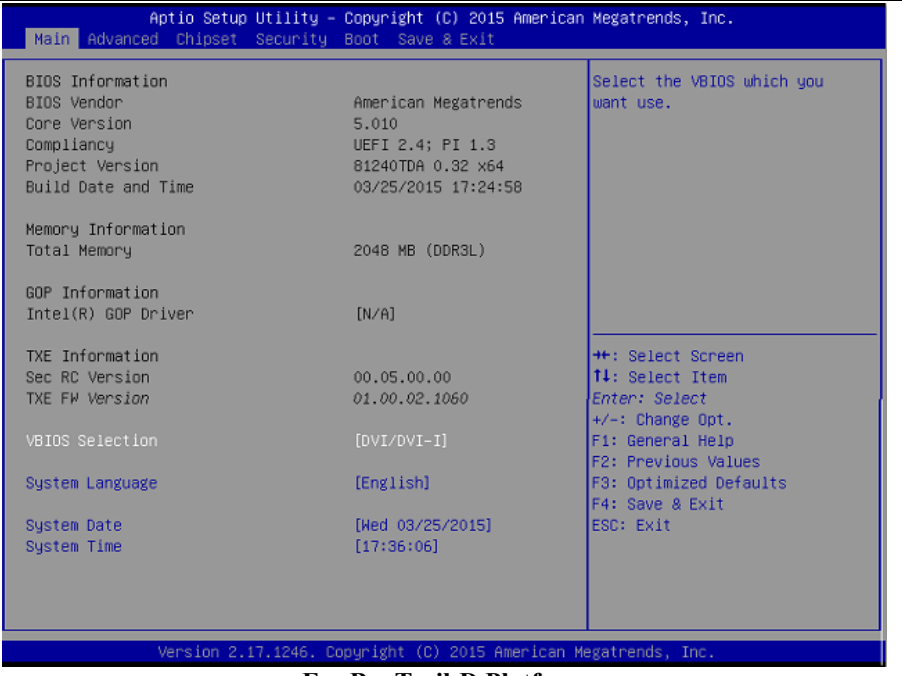
All the menu settings are described in details in this chapter.

5.2 Accessing Setup Utility

After the system is powered on, BIOS will enter the Power-On Self-Test (POST) routines and the POST message will be displayed:

Figure 5-2. POST Screen with AMI Logo

Press **<Del>** or **<Esc>** to access the Setup Utility program and the **Main** menu of the Aptio Setup Utility will appear on the screen as below:



For BayTrail-D Platform

For BayTrail-I Platform

You may move the cursor by <↑> and <↓> keys to highlight the individual menu items. As you highlight each item, a brief description of the highlighted selection will appear on the right side of the screen.

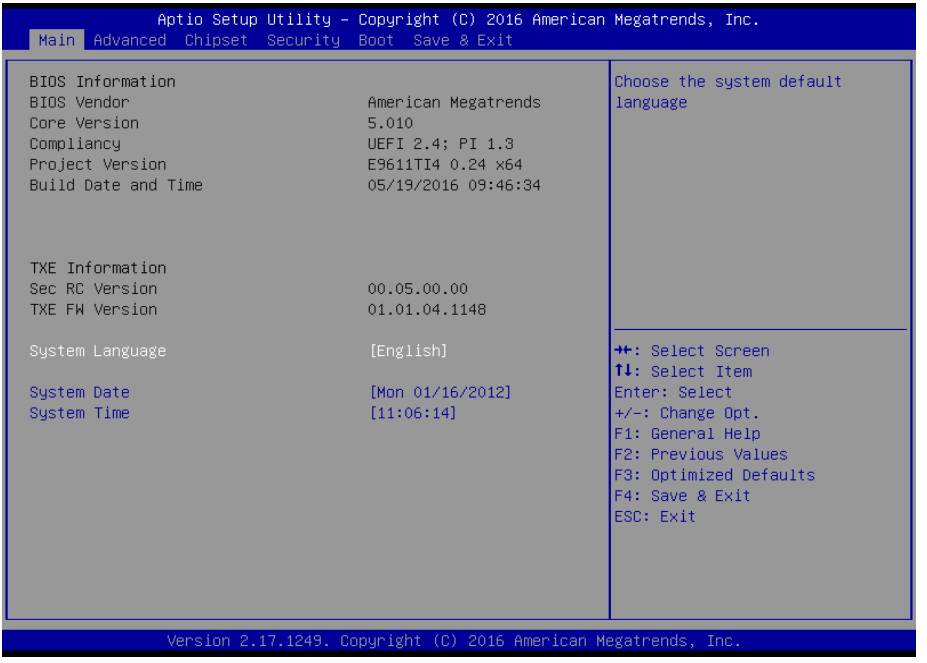
The language of the BIOS setup menu interface and help messages are shown in US English. You may use <↑> or <↓> key to select among the items and press <Enter> to confirm and enter the sub-menu. The following table provides the list of the navigation keys that you can use while operating the BIOS setup menu.

BIOS Setup Navigation Key	Description
<←> and <→>	Select a different menu screen (move the cursor from the selected menu to the left or right).
<↑> and <↓>	Select a different item (move the cursor from the selected item upwards or downwards)
<Enter>	Execute the command or select the sub-menu.
<F2>	Load the previous configuration values.
<F3>	Load the default configuration values.
<F4>	Save the current values and exit the BIOS setup menu.
<Esc>	Close the sub-menu. Trigger the confirmation to exit BIOS setup menu.

5.3 Main

Menu Path *Main*

The **Main** menu allows you to view the BIOS Information, change the system date and time, and view the user access privilege level. Use tab to switch between date elements. Use <↑> or <↓> arrow keys to highlight the item and enter the value you want in each item. This screen also displays the BIOS version (project) and BIOS Build Date and Time.



Main Screen

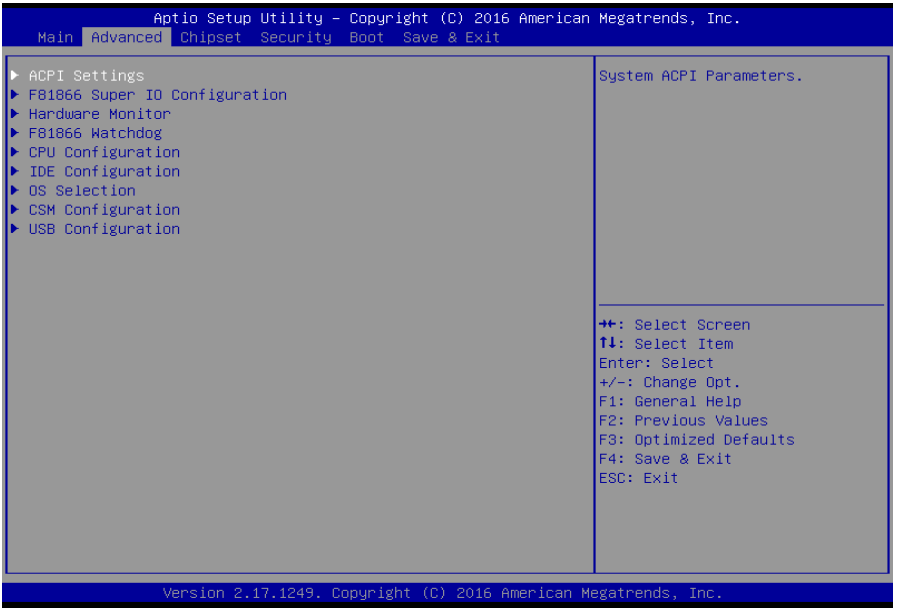
BIOS Setting	Options	Description/Purpose
BIOS Vendor	No changeable options	Displays the BIOS vendor.
Core Version	No changeable options	Displays the current BIOS core version.
Compliancy	No changeable options	Displays the current UEFI version.
Project Version	No changeable options	Displays the version of the BIOS currently installed on the platform.
Build Date and Time	No changeable options	Displays the date of current BIOS version.
TXE Information	No changeable options	Displays the GOP driver version.
Sec RC Version	No changeable options	Displays the current Sec RC version.

BIOS Setting	Options	Description/Purpose
TXE FW Version	No changeable options	Displays the current TXE Version
System Language	English	BIOS Setup language.
System Date	Month, day, year	Sets the system date. The format is [Day Month/ Date/ Year]. Users can directly enter values or use <+> or <-> arrow keys to increase/decrease it. The “Day” is automatically changed.
System Time	Hour, minute, second	Sets the system time. The format is [Hour: Minute: Second]. Users can directly enter values or use <+> or <-> arrow keys to increase/decrease it.

5.4 Advanced

Menu Path *Advanced*

This menu provides advanced configurations such as ACPI Settings, F81866 Super IO Configuration, Hardware Monitor, F81866 Watchdog, CPU Configuration, IDE Configuration, OS Selection, CSM Configuration and USB Configuration.



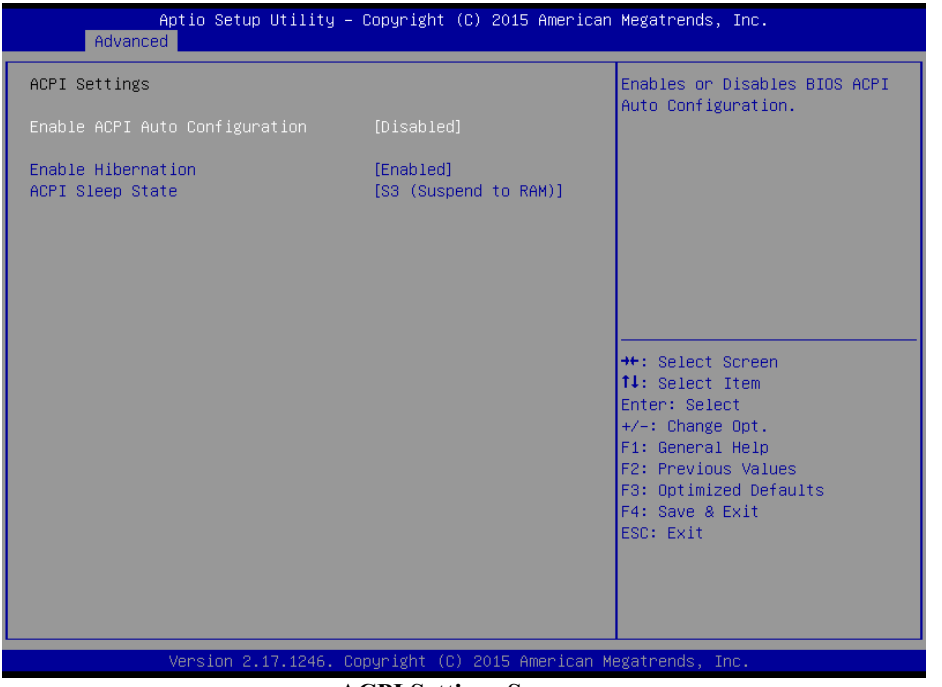
Advanced Screen

BIOS Setting	Options	Description/Purpose
ACPI Settings	Sub-Menu	System ACPI Parameters.
F81866 Super IO Configuration	Sub-Menu	System Super IO Chip Configuration.
Hardware Monitor	Sub-Menu	Monitor hardware status
F81866 Watchdog	Sub-Menu	F81866 relation function.
CPU Configuration	Sub-Menu	CPU Configuration. Parameters.
IDE Configuration	Sub-Menu	SATA Configuration Parameters.
OS Selection	Sub-Menu	OS selection settings.
CSM Configuration	Sub-Menu	Configure Option ROM execution, boot options filters, etc..
USB Configuration	Sub-Menu	USB Configuration Parameters.

5.4.1 Advanced – ACPI Settings

Menu Path *Advanced > ACPI Settings*

The **ACPI Settings** allows users to configure relevant ACPI (Advanced Configuration and Power Management Interface) settings, such as Hibernation and Enable Sleep.



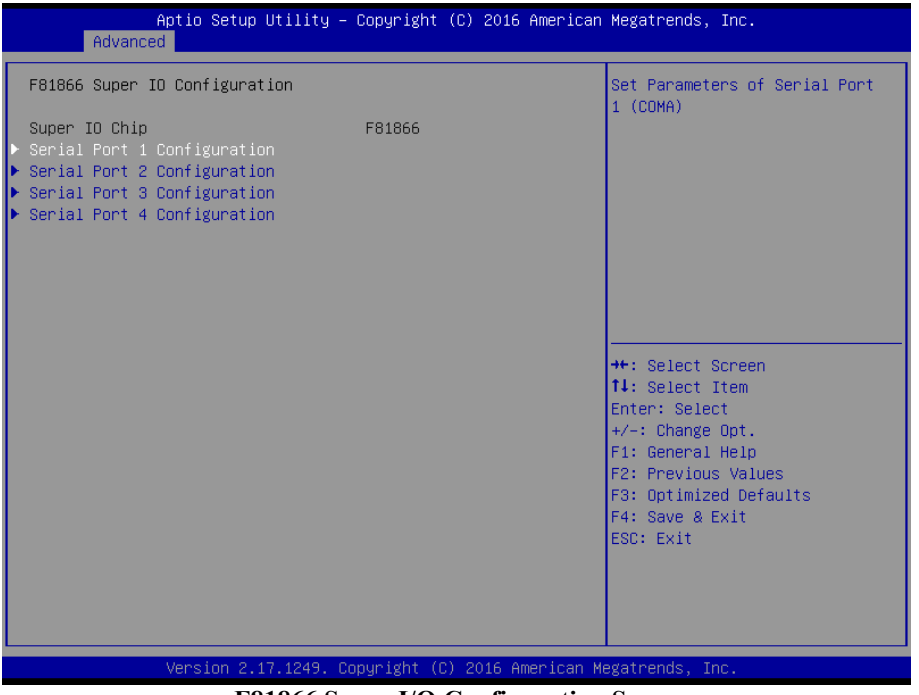
ACPI Settings Screen

BIOS Setting	Options	Description/Purpose
Enable ACPI Auto Configuration	- Disabled - Enabled	Enables or Disables ACPI feature.
Enable Hibernation	- Disabled - Enabled	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	- Suspend Disabled - S3 Only (Suspend to RAM)	Specifies the ACPI sleep state. **Suspend Disabled** disables ACPI sleep feature. **S3** allows the platform to enter Suspend to RAM mode.

5.4.2 Advanced – F81866 Super IO Configuration

Menu Path *Advanced > F81866 Super IO Configuration*

The **F81866 Super IO Configuration** allows users to configure the serial ports 1-4.

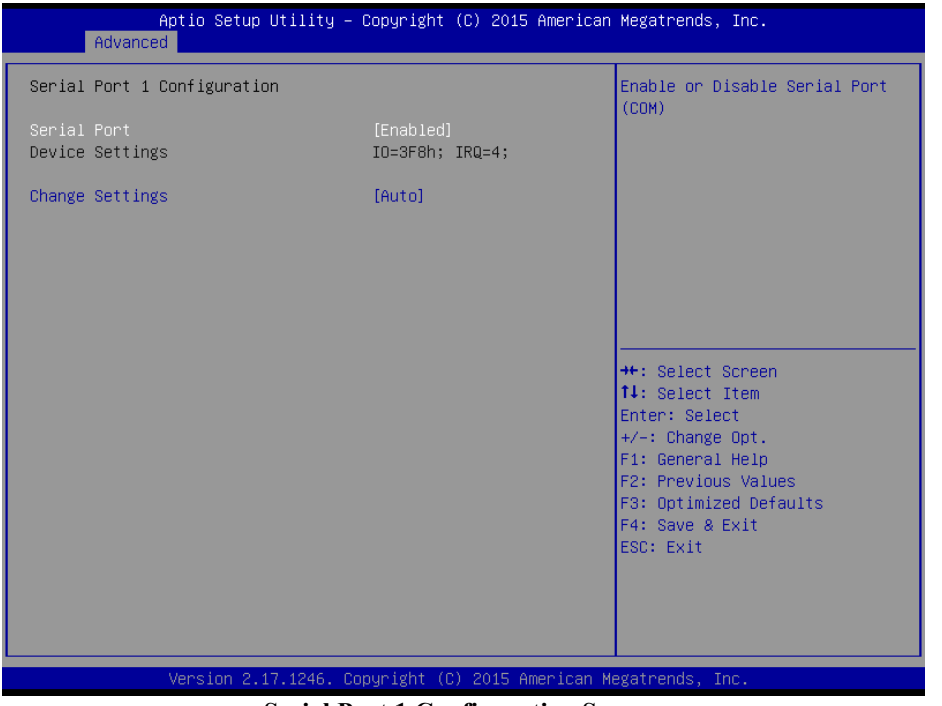


F81866 Super I/O Configuration Screen

BIOS Setting	Options	Description/Purpose
Super IO Chip	No changeable options	Displays the super I/O chip model and its manufacturer.
Serial Port 1 Configuration	Sub-Menu	Set Parameters for COMA
Serial Port 2 Configuration	Sub-Menu	Set Parameters for COMB
Serial Port 3 Configuration	Sub-Menu	Set Parameters for COMC
Serial Port 4 Configuration	Sub-Menu	Set Parameters for COMD

5.4.3 F81866 Super IO Configuration – Serial Port 1 Configuration

Menu Path *Advanced > F81866 Super IO Configuration > Serial Port 1 Configuration*

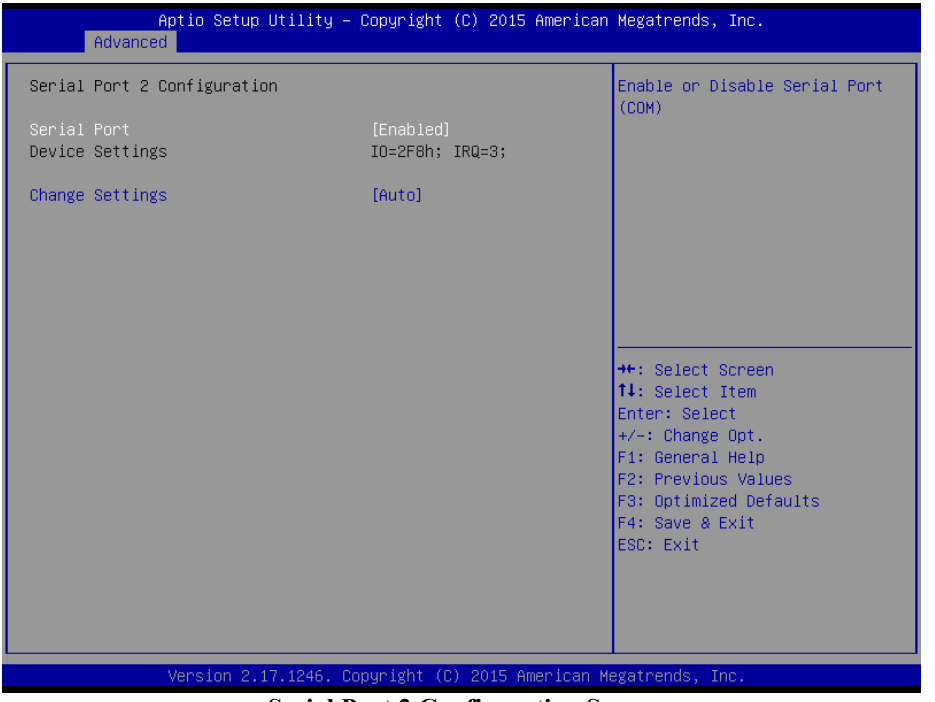


Serial Port 1 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	-Disabled -Enabled	Enable or Disable Serial Port 1.
Device Settings	No changeable options	Displays the current settings of Serial Port 1.
Change Settings	-Auto -IO=3F8h; IRQ=4 -IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12	Allows you to select specific I/O address and IRQ for Serial Port 1.

5.4.4 F81866 Super IO Configuration – Serial Port 2 Configuration

Menu Path	*Advanced > F81866 Super IO Configuration > Serial Port 2 Configuration*

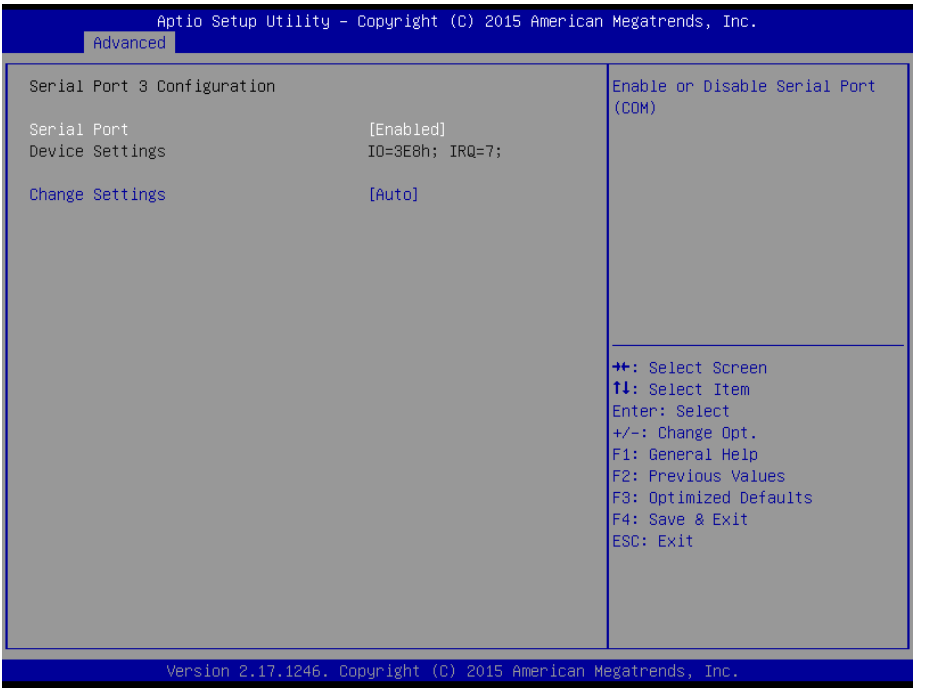


Serial Port 2 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	-Disabled -Enabled	Enable or Disable Serial Port 2.
Device Settings	No changeable options	Displays the current settings of Serial Port 2.
Change Settings	-Auto -IO=2F8h; IRQ=3 -IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12	Allows you to select specific I/O address and IRQ for Serial Port 2.

5.4.5 F81866 Super IO Configuration – Serial Port 3 Configuration

Menu Path *Advanced > F81866 Super IO Configuration > Serial Port 3 Configuration*

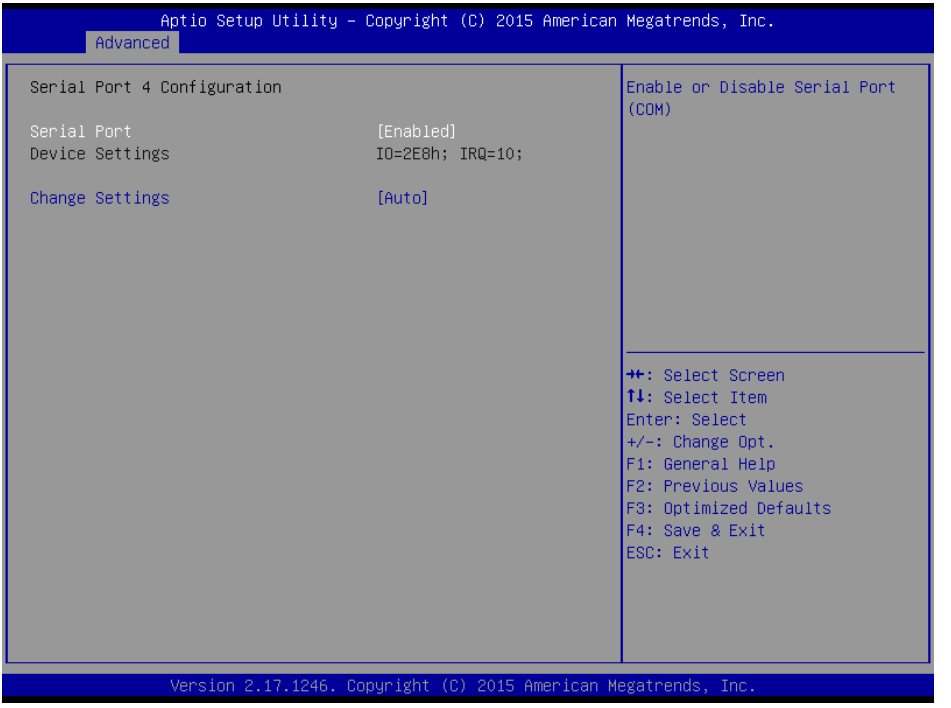


Serial Port 3 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	-Disabled -Enabled	Enables or Disables Serial Port 3.
Device Settings	No changeable options	Displays the current settings of Serial Port 3.
Change Settings	-Auto -IO=3E8h; IRQ=7 -IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12	Allows you to select specific I/O address and IRQ for Serial Port 3.

5.4.6 F81866 Super IO Configuration – Serial Port 4 Configuration

Menu Path *Advanced > F81866 Super IO Configuration > Serial Port 4 Configuration*



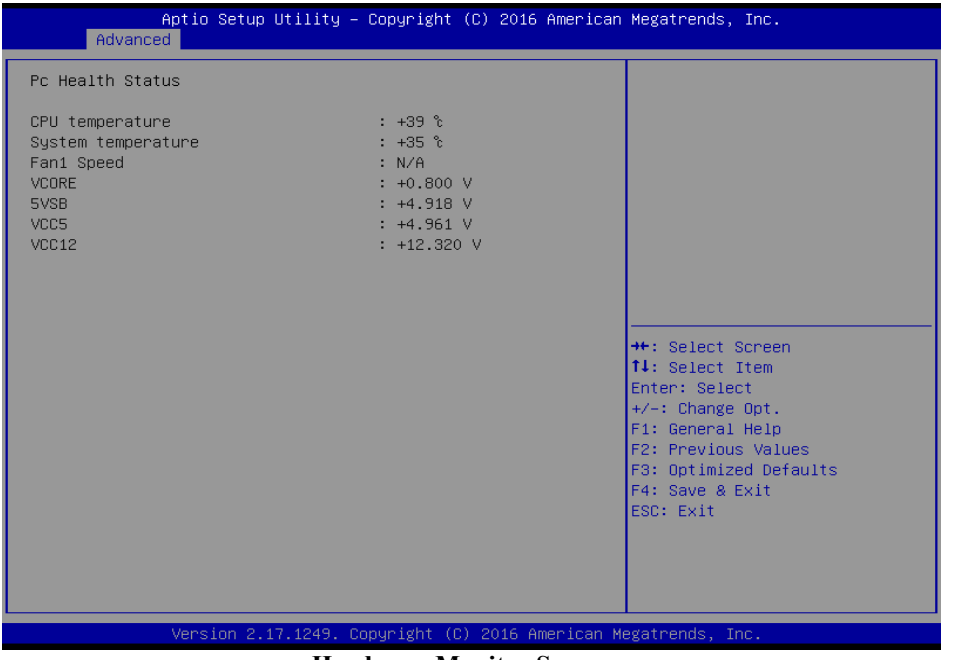
Serial Port 4 Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial Port	-Disabled -Enabled	Enables or Disables Serial Port 4.
Device Settings	No changeable options	Displays the current settings of Serial Port 4.
Change Settings	-Auto -IO=2E8h; IRQ=10 -IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 -IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12	Allows you to select specific I/O address and IRQ for Serial Port 4.

5.4.7 Advanced – Hardware Monitor

Menu Path	*Advanced > Hardware Monitor*

The **Hardware Monitor** allows users to monitor the health and status of the system such as CPU temperature, system temperature, system fan speed and voltage levels in supply.



Hardware Monitor Screen

BIOS Setting	Options	Description/Purpose
CPU temperature	No changeable options	Displays processor's temperature.
System temperature	No changeable options	Displays system's temperature.
Fan1 Speed	No changeable options	Displays fan speed.
VCORE	No changeable options	Displays voltage level of the +VCORE in supply.

BIOS Setting	Options	Description/Purpose
5VSB	No changeable options	Displays voltage level of the +VSB5 in supply.
VCC5	No changeable options	Displays voltage level of the + VCC5 in supply.
VCC12	No changeable options	Displays voltage level of the + VCC12 in supply.

5.4.8 Advanced - F81866 Watchdog

Menu Path *Advanced > F81866 Watchdog*

If the system hangs or fails to respond, enable the F81866 watchdog function to trigger a system reset via the 255-level watchdog timer.

F81866 Watchdog Screen

BIOS Setting	Options	Description/Purpose
Enable WatchDog	-Disabled -Enabled	Enables / Disables Watchdog timer.
Watch Dog timer unit	-1s - 60s	Sets the desired value seconds or minutes for watchdog timer.
Count for Timer (Seconds)	multiple options ranging from 1 to 255	Sets the desired value (seconds) for watchdog timer.

5.4.9 Advanced – CPU Configuration

Menu Path *Advanced > CPU Configuration*

The **CPU Configuration** provides advanced CPU settings such as CPU speed and some information about CPU.

CPU Configuration Screen

BIOS Setting	Options	Description/Purpose
CPU Signature	No changeable options	Reports the CPU Signature
Socket 0 CPU Information	Sub-Menu	Report CPU Information
CPU Speed	No changeable options	Reports the current CPU Speed
64-bit	No changeable options	Reports if 64-bit is supported by processor.

BIOS Setting	Options	Description/Purpose
Limit CPUID Maximum	- Disabled - Enabled	Enables for legacy operating systems to boot processors with extended CPUID functions. Set disable for WinXP.
Intel Virtualization Technology	- Disabled - Enabled	When enabled, a VMM can utilize the additional hardware capabilities provided by vanderpool technology

Socket 0 CPU Information

Menu Path *Advanced > CPU Configuration > Socket 0 CPU Information*

Socket 0 CPU Information Screen

BIOS Setting	Options	Description/Purpose
CPU Signature	No changeable options	Reports the CPU Signature
Microcode Patch	No changeable options	Reports the CPU Microcode Patch Version.
Max CPU Speed	No changeable options	Reports the maximum CPU Speed.

BIOS Setting	Options	Description/Purpose
Min CPU Speed	No changeable options	Reports the minimum CPU Speed
Processor Cores	No changeable options	Displays number of physical cores in processor.
Intel HT Technology	No changeable options	Reports if Intel Hyper-Threading Technology is supported by processor
Intel VT-x Technology	No changeable options	Reports if Intel VT-x Technology is supported by processor.
L1 Data Cache	No changeable options	Displays size of L1 Data Cache
L1 Code Cache	No changeable options	Displays size of L1 Code Cache
L2 Cache	No changeable options	Displays size of L2 Cache.
L3 Cache	No changeable options	Displays size of L3 Cache.

5.4.10 Advanced –IDE Configuration

Menu Path *Advanced > IDE Configuration*

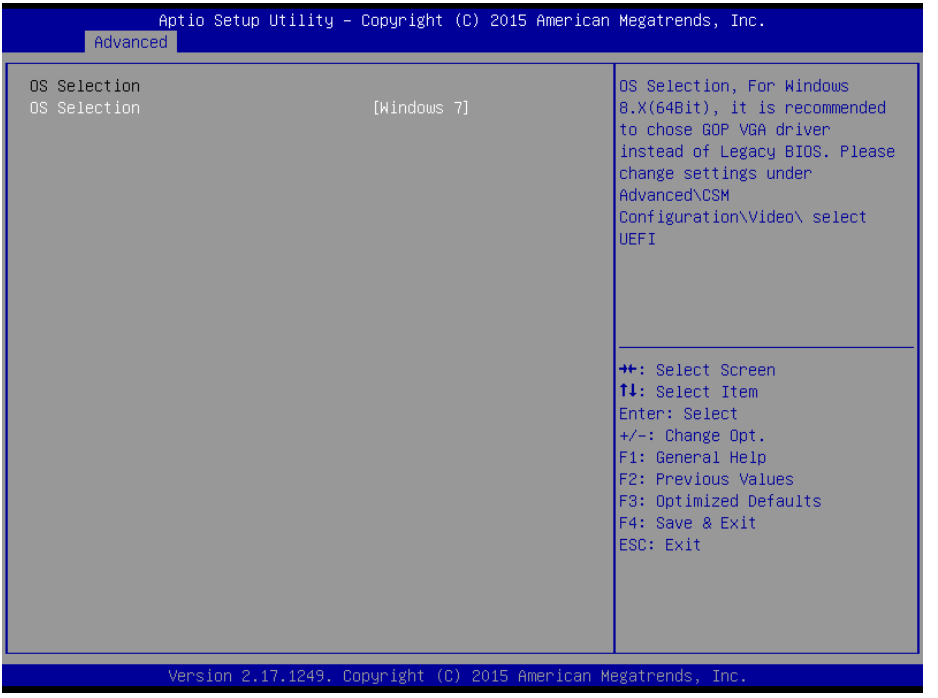
IDE Configuration Screen

BIOS Setting	Options	Description/Purpose
Serial-ATA (SATA)	- Disabled - Enabled	Enables or Disables SATA Device.
SATA Test Mode	- Disabled - Enabled	Enables / Disables Test Mode
SATA Speed Support	- Gen1 - Gen2	SATA Speed Support Gen1 or Gen2.
SATA Mode	- IDE mode - AHCI mode	Configures SATA as follows: **IDE:** Set SATA operation mode to IDE mode. **AHCI:** SATA works as AHCI (Advanced Host Controller Interface) mode for getting better performance.

BIOS Setting	Options	Description/Purpose
Serial-ATA Port 0	- Disabled - Enabled	Enables or Disables SATA Port 0 Device.
SATA Port0 HotPlug	- Disabled - Enabled	Enables or Disables SATA Port0 HotPlug.
Serial-ATA Port 1	- Disabled - Enabled	Enables or Disables SATA Port 1 Device.
SATA Port1 HotPlug	- Disabled - Enabled	Enables or Disables SATA Port1 HotPlug.
SATA Port 0	[drive]	Displays the drive installed on this SATA Port 0. Shows [Empty] if no drive is installed.
SATA Port 1	[drive]	Displays the drive installed on this SATA Port 1. Shows [Empty] if no drive is installed.

5.4.11 Advanced – OS Selection

Menu Path *Advanced > OS Selection*



OS Selection Configuration Screen

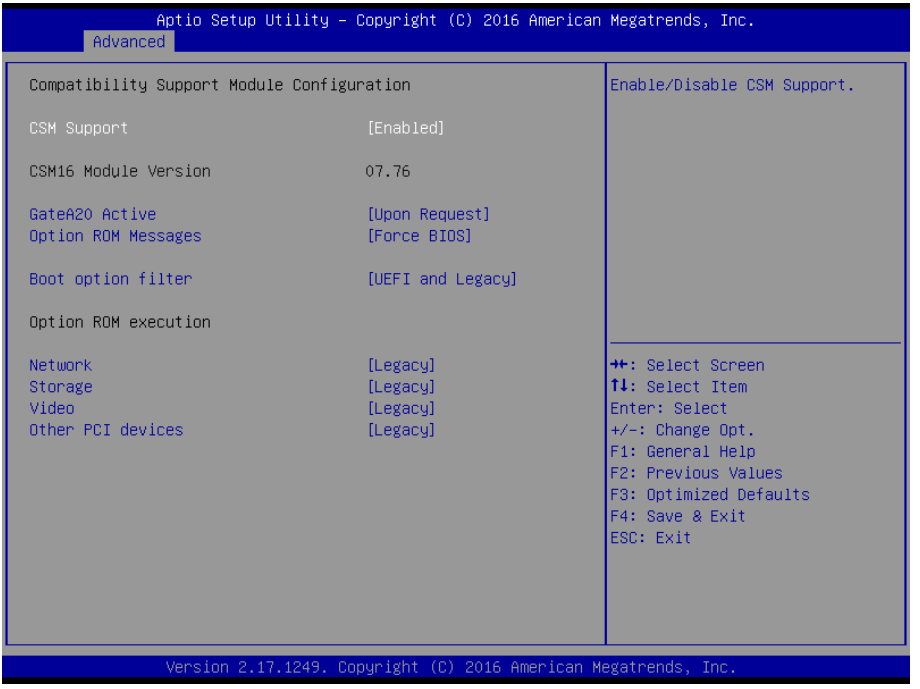
BIOS Setting	Options	Description/Purpose
OS Selection	- Windows 8.X - Windows 7	Selects Windows 8.X or Windows 7 Operating System.

OS Selection: For Windows 8.X(64Bit), it is recommended to choose GOP VGA driver instead of Legacy BIOS. Please change settings under Advanced\ CSM\ Configuration\ Video\ select UEFI.

5.4.12 Advanced – CSM Configuration

Menu Path *Advanced > CSM Configuration*

The **CSM Configuration** provides advanced CSM (Compatibility Support Module) configurations such as Enable/Disable CSM Support, configure Option ROM execution, boot option filter, etc.



CSM Configuration Screen

BIOS Setting	Options	Description/Purpose
CSM Support	- Disabled - Enabled	Disables or Enables CSM support
CSM16 Module Version	No changeable options	Displays the current CSM (Compatibility Support Module) version.
GateA20 Active	- Upon Request - Always	Selects Gate A20 operation mode. **UPON REQUEST**: GA20 can be disabled using BIOS services. **ALWAYS:** do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

BIOS Setting	Options	Description/Purpose
Option ROM Messages	- Force BIOS - Keep Current	Sets display mode for Option ROM messages.
Boot option filter	- UEFI and Legacy - Legacy only - UEFI only	This option controls what kind of devices system can boot.
Network	- Do not launch - UEFI - Legacy	Controls the execution of UEFI or Legacy PXE
Storage	- Do not launch - UEFI - Legacy	Controls the execution of UEFI or Legacy Storage
Video	- Do not launch - UEFI - Legacy	Controls the execution of UEFI and Legacy Video.
Other PCI devices	- Do not launch - UEFI - Legacy	Determines OpROM execution policy for devices other than Network, Storage, or Video.

5.4.13 Advanced – USB Configuration

Menu Path *Advanced > USB Configuration*

The **USB Configuration** allows users to configure advanced USB settings such as Legacy USB support.

USB Configuration Screen

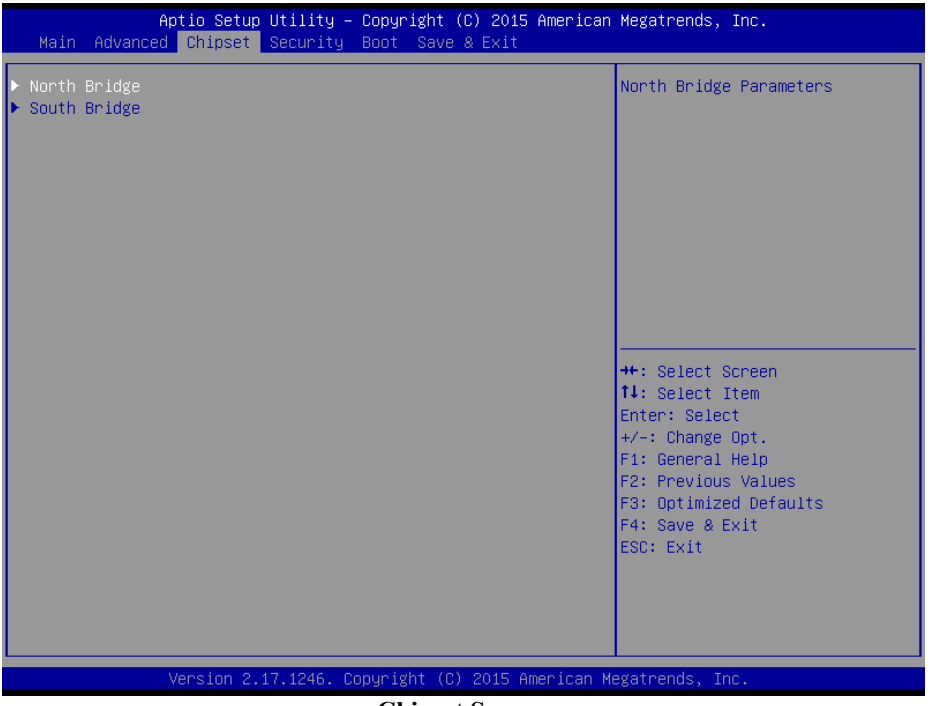
BIOS Setting	Options	Description/Purpose
USB Devices	No changeable options	Displays the number of available USB Devices.
Legacy USB Support	- Enabled - Disabled - Auto	Sets to “Enabled” if you want to use USB devices with the legacy operating systems that do not support USB.
XHCI Hand-off	- Enabled - Disabled	This is a workaround for OSes without XHCI hand-off support.
EHCI Hand-off	- Disabled - Enabled	This is a workaround for OSes without EHCI hand-off support.

BIOS Setting	Options	Description/Purpose
USB Mass Storage Driver Support.	- Disabled - Enabled	Enable/Disable USB mass storage driver support.
USB transfer time-out	1 / 5 / 10 /20 sec	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 / 20 / 30 / 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	- Auto - Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.
Device power-up delay in seconds	multiple options ranging from 0 to 40	Delay range is 1..40 seconds, in one second increments
Mass Storage Devices:	- Auto - Floppy - Force FDD - Hard Disk - CD-ROM	Displays the device name and choose the device emulation type.

5.5 Chipset

Menu Path	*Chipset*

This menu allows users to configure advanced Chipset settings such as North Bridge and South Bridge configuration parameters.

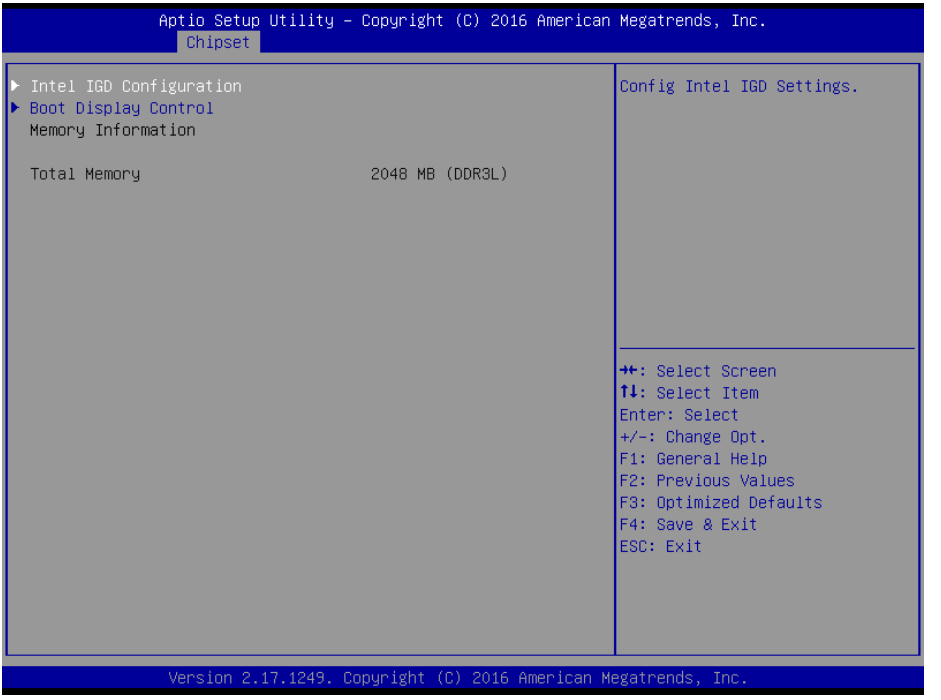


Chipset Screen

BIOS Setting	Options	Description/Purpose
North Bridge	Sub-Menu	Sets Parameter for Panther Point (North Bridge) configuration.
South Bridge	Sub-Menu	Sets Parameter for Ivy Bridge (South Bridge) configuration.

5.5.1 Chipset - North Bridge

Menu Path *Chipset > North Bridge*

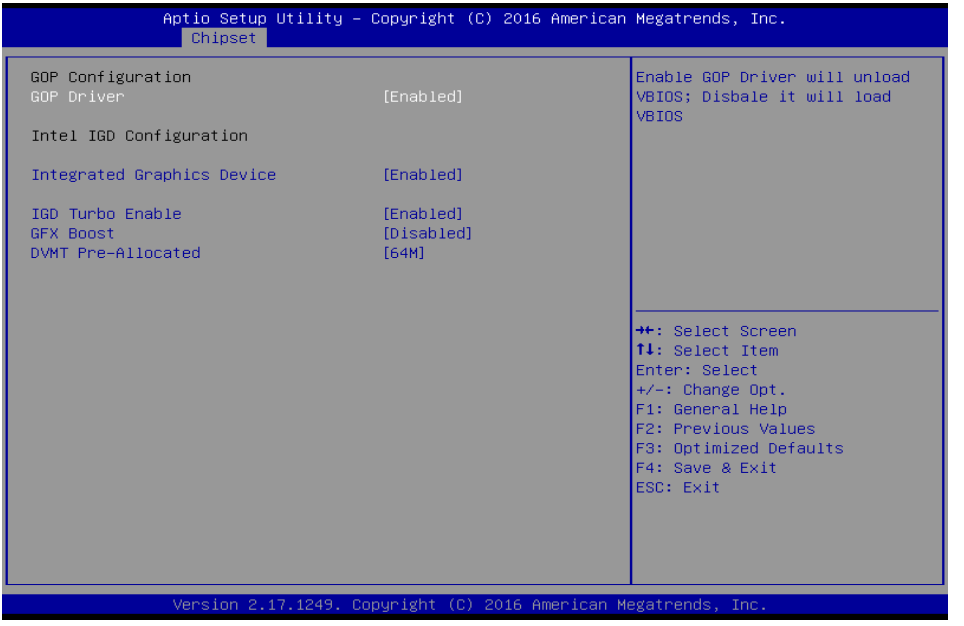


North Bridge Screen

BIOS Setting	Options	Description/Purpose
Intel IGD Configuration	Sub-Menu	Configures Intel IGD Settings.
Boot Display Control	Sub-Menu	Boot Display Control.
Memory Information	No changeable options	Displays the DRAM information on platform.
Total Memory	No changeable options	Displays the DRAM size

North Bridge - Intel IGD Configuration

Menu Path *Chipset > North Bridge > Intel IGD Configuration*

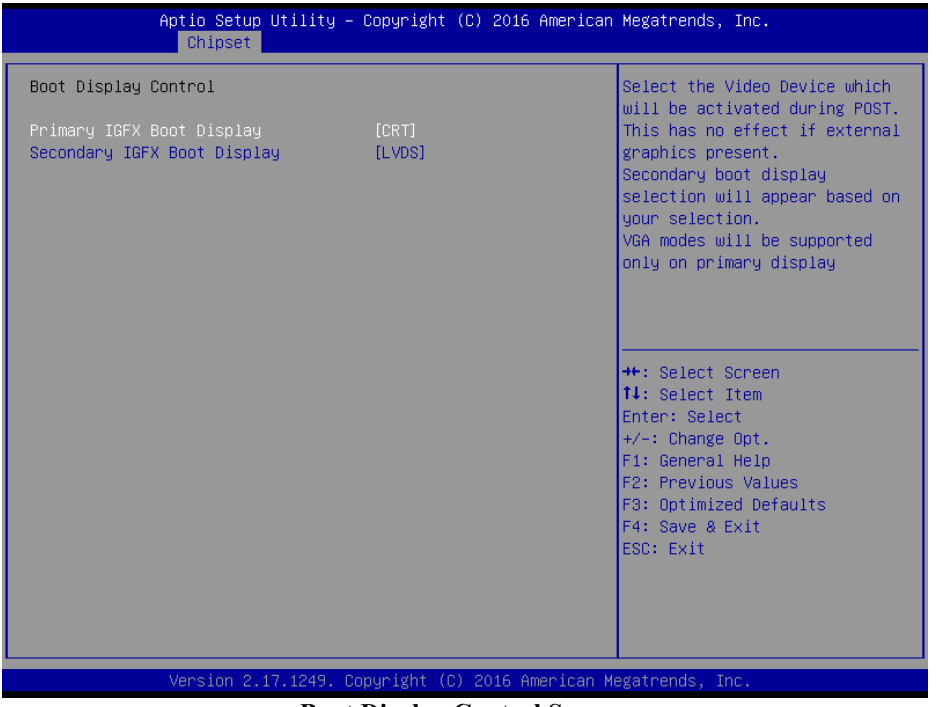


GOP Configuration Screen

BIOS Setting	Options	Description/Purpose
GOP Driver	- Enabled - Disabled	Enables or Disables GOP Driver for UEFI OS
Intel IGD Configuration	No changeable options	Displays the IGD information on platform.
Integrated Graphics Device	- Enabled - Disabled	Enable: Enable Integrated Graphics Device (IGD) when selected as the Primary Video Adaptor. Disable: Always disable IGD"
IGD Turbo Enable	- Enabled - Disabled	Enable or Disable IGD Turbo
GFX Boost	- Enabled - Disabled	Enables or Disables GFX Boost accelerated graphics processing
DVMT Pre-Allocated	- 64M - 96M - 128M - 256M - 512M	Selects DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

North Bridge - Boot Display Control

Menu Path *Chipset > North Bridge > Boot Display Control*

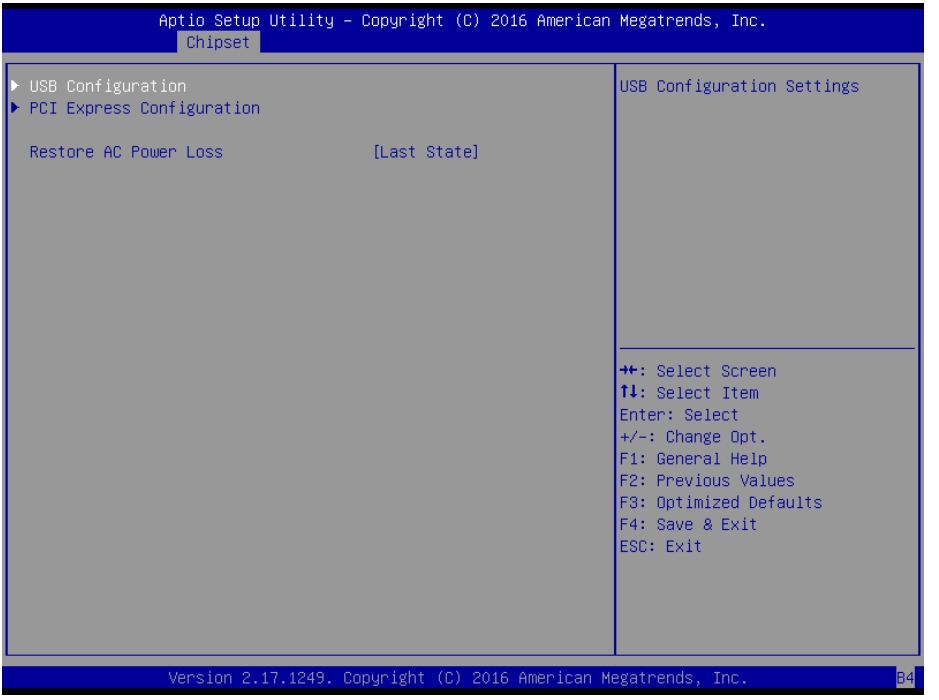


Boot Display Control Screen

BIOS Setting	Options	Description/Purpose
Primary IGFX Boot Display	- CRT - LVDS	Selects the Video Device which will be activated during POST.
Secondary IGFX Boot Display	- Disabled - CRT - LVDS	Selects the Video Device which will be activated during POST.

5.5.2 Chipset - South Bridge

Menu Path *Chipset > South Bridge*

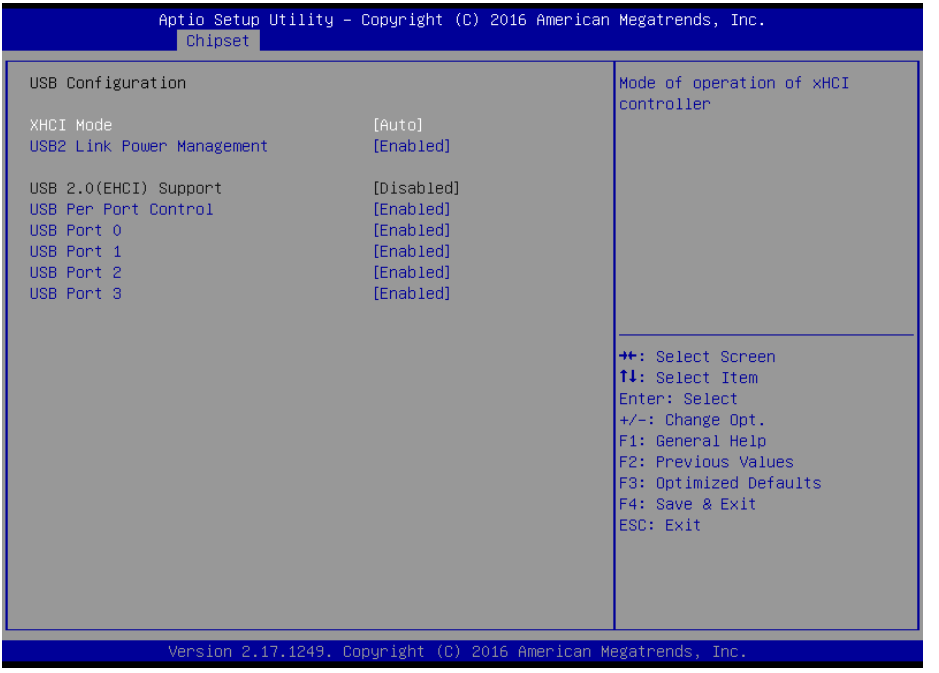


South Bridge Screen

BIOS Setting	Options	Description/Purpose
USB Configuration	Sub-Menu	USB Configuration Settings.
PCI Express Configuration	Sub-Menu	PCI Express Configuration Settings.
Restore AC Power Loss	- Power Off - Power On - Last State	Selects AC power state when power is re-applied after a power failure. **Power Off** keeps the power off till the power button is pressed. **Power On** makes system power on after restores AC power to the board. **Last State** brings system back to the last power state before AC remove.

South Bridge - USB Configuration

Menu Path *Chipset > South Bridge > USB Configuration*



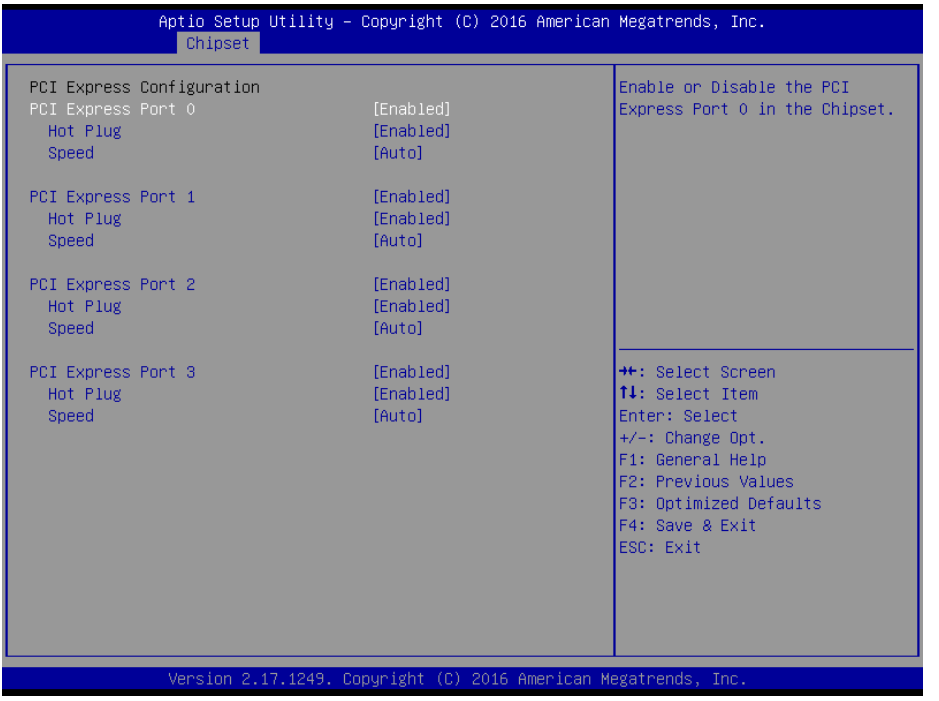
USB Configuration Screen`

BIOS Setting	Options	Description/Purpose
XHCI Mode	- Disabled - Enabled - Auto - Smart Auto	Selects operation mode of XHCI controller.
USB2 Link Power Management	- Disabled - Enabled	Enables or Disables USB2 Link Power Management.
USB 2.0(EHCI) Support	- Disabled - Enabled	(XHCI Mode need set disabled.) Enables Enhanced Host Controller Interface 1 for high-speed USB functions (USB 2.0).
USB Per Port Control	- Disabled - Enabled	Enables or Disables per USB Port
USB Port 0	- Disabled - Enabled	Enables or Disables USB Port 0.
USB Port 1	- Disabled - Enabled	Enables or Disables USB Port 1.

BIOS Setting	Options	Description/Purpose
USB Port 2	- Disabled - Enabled	Enables or Disables USB Port 2.
USB Port 3	- Disabled - Enabled	Enables or Disables USB Port 3.

South Bridge - PCI Express Configuration

Menu Path *Chipset > South Bridge > PCI Express Configuration*



PCI Express Configuration Screen

BIOS Setting	Options	Description/Purpose
PCI Express Port 0	- Disabled - Enabled	Enables or Disables PCI Express Port 0.
Hot Plug	- Disabled - Enabled	Enables or Disables PCI Express Hot Plug.

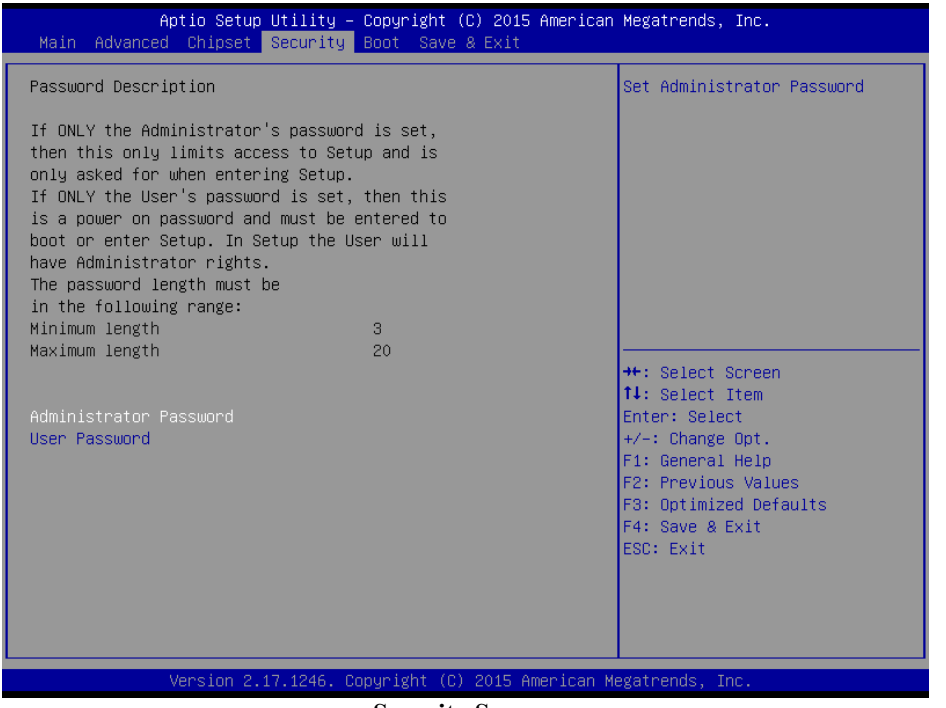
BIOS Setting	Options	Description/Purpose
speed	- Auto - Gen1 - Gen2	Selection PCI Express Port 0 Speed.
PCI Express Port 1	- Disabled - Enabled	Enables or Disables PCI Express Port 1.
Hot Plug	- Disabled - Enabled	Enables or Disable PCI Express Hot Plug.
speed	- Auto - Gen1 - Gen2	Selects PCI Express Port 1 Speed.
PCI Express Port 2	- Disabled - Enabled	Enables or Disables PCI Express Port 2.
Hot Plug	- Disabled - Enabled	Enables or Disables PCI Express Hot Plug.
speed	- Auto - Gen1 - Gen2	Selects PCI Express Port 2 Speed.
PCI Express Port 3	- Disabled - Enabled	Enabled or Disabled PCI Express Port 3
Hot Plug	- Disabled - Enabled	Enabled or Disabled PCI Express Hot Plug.
speed	- Auto - Gen1 - Gen2	Selects PCI Express Port 3 speed.

5.6 Security

Menu Path *Security*

From the Security menu, you are allowed to create, change or clear the administrator password. You will be asked to enter the configured administrator password before you can access the Setup Utility.

By setting an administrator password, you will prevent other users from changing your BIOS settings. You can configure an Administrator password and then configure a user password. An administrator has much more privileges over the settings in the Setup utility than a user. Heed that a user password does not provide access to most of the features in the Setup utility.



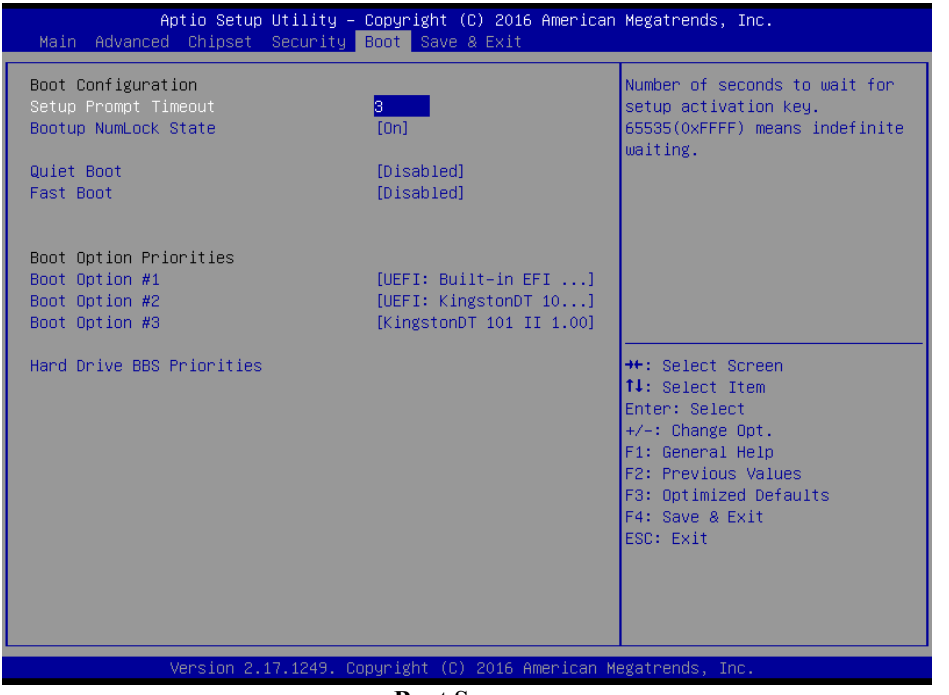
Security Screen

BIOS Setting	Options	Description/Purpose
Administrator Password	Password can be 3-20 alphanumeric characters.	Specifies Administrator password.
User Password	Password can be 3-20 alphanumeric characters.	Specifies User password.

5.7 Boot

Menu Path *Boot*

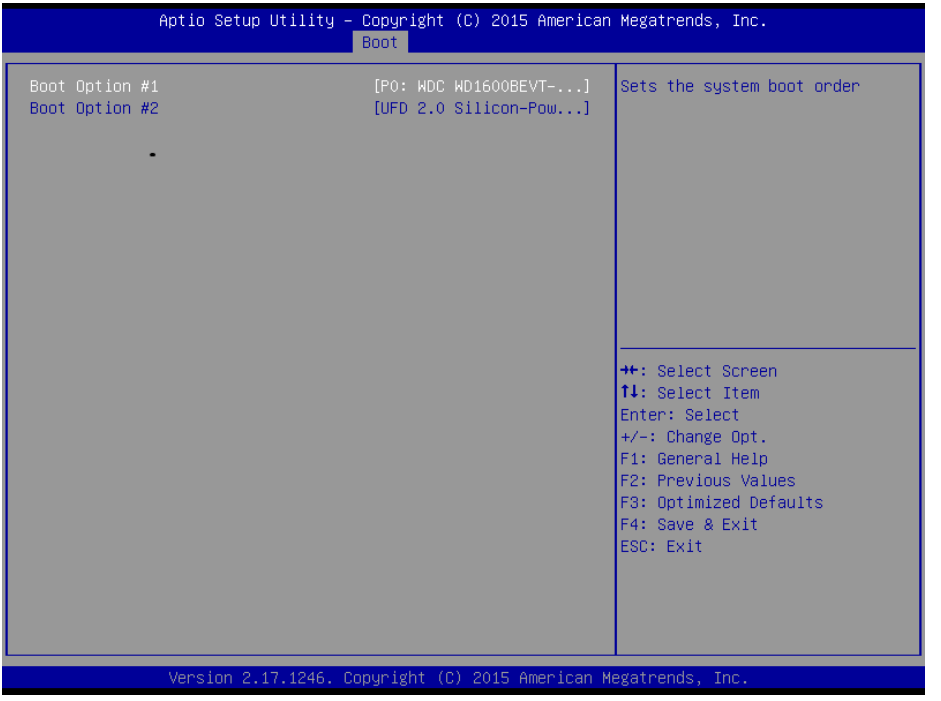
This menu provides control items for system boot configuration such as setting setup prompt timeout, enabling/disabling quiet boot and fast boot, changing the boot order from the available bootable device(s) and BBS option priorities, and setting CSM (Compatibility Support Module) configuration parameters to support legacy BIOS operation systems, various VGA, bootable devices and add-on devices for achieving better compatibility.



Boot Screen

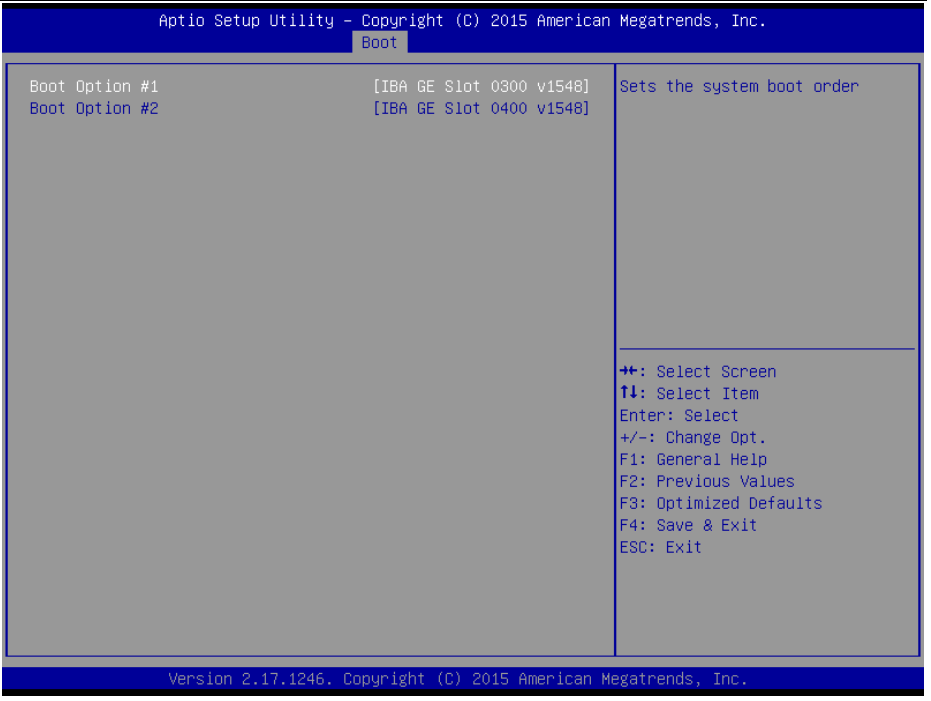
BIOS Setting	Options	Description/Purpose
Setup Prompt Timeout	Numeric	Number of seconds to wait for setup activation key.
Bootup NumLock State	- On - Off	Specifies the power-on state of the NumLock Key.
Quiet Boot	- Disabled - Enabled	Enables/Disables Quiet Boot options.

BIOS Setting	Options	Description/Purpose
Fast Boot	- Disabled - Enabled	Enables or Disables boot with initialization of a minimal set of devices required to launch active boot option.
Boot Option #1~#n	- [Drive(s)] - Disabled	Allows setting boot option listed in Hard Drive BBS Priorities.
Hard Drive BBS Priorities	Sub-Menu	Allows users to select boot order of available drive(s)
Network Device BBS Priorities	Sub-Menu	Sets the order of the legacy devices in the group.



Hard Drive BBS Priorities Screen

BIOS Setting	Options	Description/Purpose
Boot Option #1 - #n	- [Drive(s)] - Disabled	Changes the boot order of available drive(s).



Network Device BBS Priorities Screen

BIOS Setting	Options	Description/Purpose
Boot Option #1 - #n	- [Drive(s)] - Disabled	Sets the system boot order.

5.8 Save & Exit

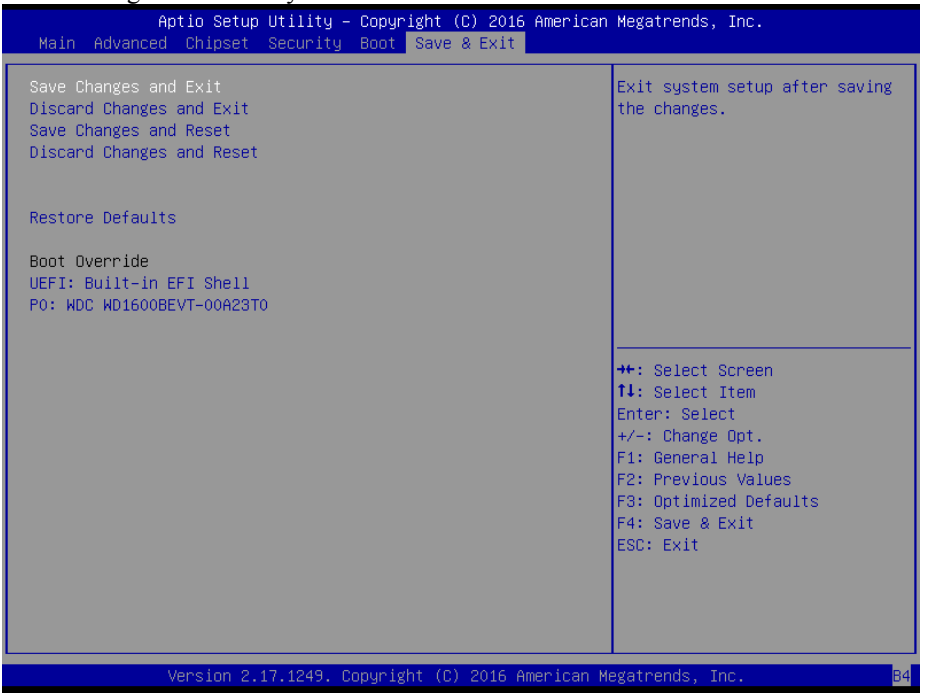
Menu Path *Save & Exit*

The Save & Exit allows users to save or discard changed BIOS settings as well as load factory default settings.

Save Changed BIOS Settings
To save and validate the changed BIOS settings, select Save Changes from the Save & Exit menu, or you can select Save Changes and Exit (or press F4) to validate the changes and then exit the system. Select Save Changes and Reset to validate the changed BIOS settings and then restart the system

Discard Changed BIOS Settings
To cancel the BIOS settings you have previously configured, select Discard Changes and Exit from this menu, or simply press Esc to exit the BIOS setup. You can also select Discard Changes and Reset to discard any changes you have made and restore the factory BIOS defaults.

Load User Defaults
You may simply press F3 at any time to load the Optimized Values which resets all BIOS settings to the factory defaults.



Save & Exit Screen

BIOS Setting	Options	Description/Purpose
Save Changes and Exit	No changeable options	Exits and saves the changes in NVRAM.
Discard Changes and Exit	No changeable options	Exits without saving any changes made in BIOS settings.
Save Changes and Reset	No changeable options	Saves the changes in NVRAM and resets.
Discard Changes and Reset	No changeable options	Resets without saving any changes made in BIOS settings.
Restore Defaults	No changeable options	Loads the optimized defaults for BIOS settings.
Boot Override	- [Drive(s)]	Forces to boot from selected [drive(s)].

Appendix A EXPANSION BUS

This appendix indicates the pin assignments.

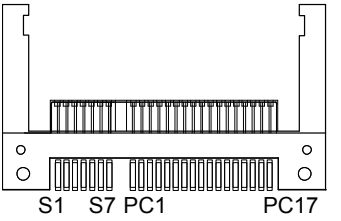
The following topic is included:

- CFast Slot Pin Assignment

CFAST SLOT PIN ASSIGNMENT

You will find a **JCFAST2** slot on BE-0961.
The pin assignments are as follows:

PIN	ASSIGNMENT
S1	GND
S2	SATA_TXP0
S3	SATA_TXN0
S4	GND
S5	SATA_RXN0
S6	SATA_RXP0
S7	GND
PC1	NC
PC2	GND
PC3	NC
PC4	NC
PC5	NC
PC6	NC
PC7	GND
PC8	NC
PC9	NC
PC10	NC
PC11	NC
PC12	NC
PC13	3.3V/5V
PC14	3.3V/5V
PC15	GND
PC16	GND
PC17	NC



JCFAST2

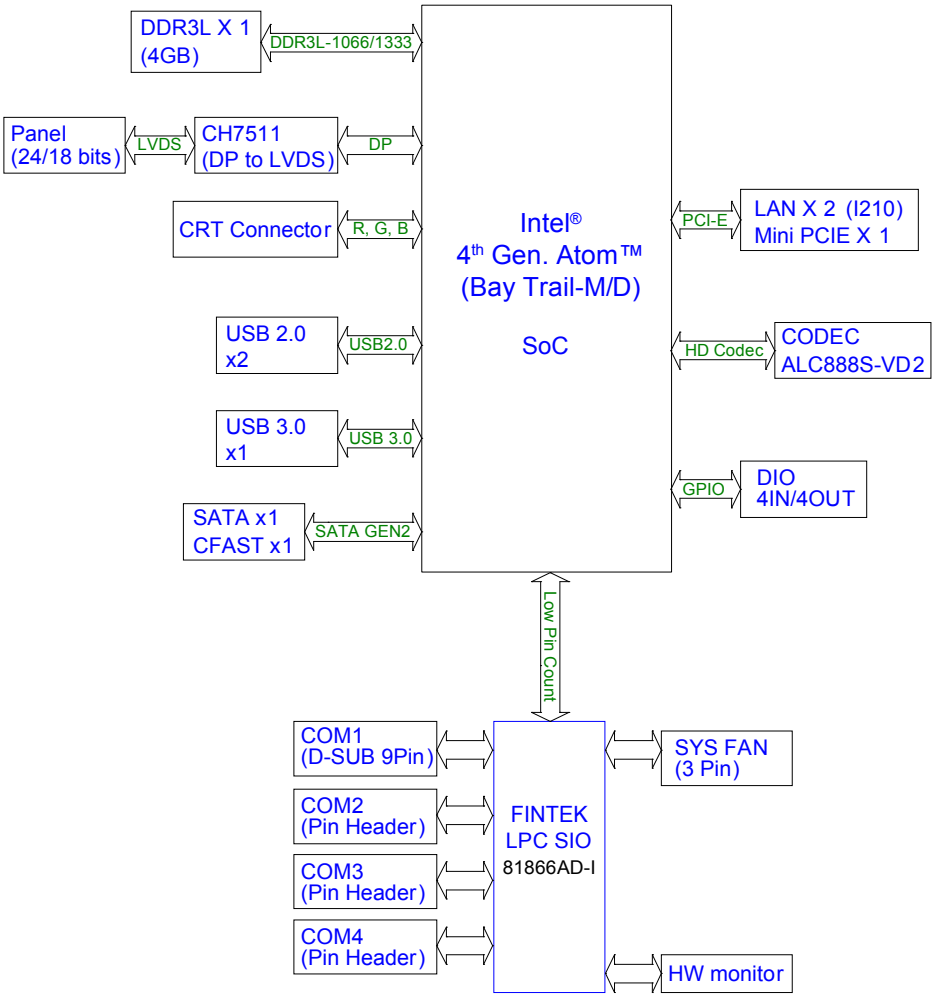
Appendix B Technical Summary

This appendix will give you a brief introduction of the allocation maps for the system resources.

The following topics are included:

- Block Diagram
- Interrupt Map
- I/O Map
- Memory Map
- Configuring WatchDog Timer
- Flash BIOS Update

Block Diagram



I/O Map

I/O MAP	ASSIGNMENT
0x00000000-0x0000006F	PCI bus
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x0000002E-0x0000002F	Motherboard resources
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x00000040-0x00000043	System timer
0x0000004E-0x0000004F	Motherboard resources
0x00000050-0x00000053	System timer
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000070	Motherboard resources
0x00000070-0x00000070	System CMOS/real time clock
0x00000078-0x00000CF7	PCI bus
0x00000080-0x0000008F	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B2-0x000000B3	Motherboard resources
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000002E0-0x000002EF	Communications Port (COM4)
0x000002F8-0x000002FF	Communications Port (COM2)

I/O MAP	ASSIGNMENT
0x000003B0-0x000003BB	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0x000003C0-0x000003DF	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0x000003E8-0x000003EF	Communications Port (COM3)
0x000003F8-0x000003FF	Communications Port (COM1)
0x00000400-0x0000047F	Motherboard resources
0x000004D0-0x000004D1	Programmable interrupt controller
0x00000500-0x000005FE	Motherboard resources
0x00000600-0x0000061F	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x00000D00-0x0000FFFF	PCI bus
0x0000C000-0x0000C01F	Ethernet Controller
0x0000C000-0x0000CFFF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express-Root Port4 - 0F4E
0x0000D000-0x0000D01F	Ethernet Controller
0x0000D000-0x0000DFFF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express-Root Port3 - 0F4C
0x0000E000-0x0000E01F	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
0x0000E020-0x0000E03F	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000E040-0x0000E043	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000E050-0x0000E057	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000E060-0x0000E063	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000E070-0x0000E077	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000E080-0x0000E087	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900

I/O MAP	ASSIGNMENT
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B2-0x000000B3	Motherboard resources
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000002E0-0x000002EF	Communications Port (COM4)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003B0-0x000003BB	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0x000003C0-0x000003DF	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0x000003E8-0x000003EF	Communications Port (COM3)
0x000003F8-0x000003FF	Communications Port (COM1)
0x00000400-0x0000047F	Motherboard resources
0x000004D0-0x000004D1	Programmable interrupt controller
0x00000500-0x000005FE	Motherboard resources
0x00000600-0x0000061F	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A20-0x00000A2F	Motherboard resources
0x00000D00-0x0000FFFF	PCI bus
0x0000C000-0x0000C01F	Ethernet Controller
0x0000C000-0x0000CFFF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express-Root Port4 - 0F4E
0x0000D000-0x0000D01F	Ethernet Controller
0x0000D000-0x0000DFFF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express-Root Port3 - 0F4C
0x0000E000-0x0000E01F	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
0x0000E020-0x0000E03F	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000E040-0x0000E043	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000E050-0x0000E057	Intel(R) Atom(TM)/Celeron(R)/Pentium(R)

I/O MAP	ASSIGNMENT
	Processor AHCI - 0F23
0x0000E060-0x0000E063	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000E070-0x0000E077	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0x0000E080-0x0000E087	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900

Interrupt Map

IRQ MAP	ASSIGNMENT
(ISA) IRQ 0	System timer
(ISA) IRQ 3	Communications Port (COM2)
(ISA) IRQ 4	Communications Port (COM1)
(ISA) IRQ 7	Communications Port (COM3)
(ISA) IRQ 8	High precision event timer
(ISA) IRQ10	Communications Port (COM4)
(ISA) IRQ 81	Microsoft ACPI-Compliant System
(ISA) IRQ 82	Microsoft ACPI-Compliant System
(ISA) IRQ 83	Microsoft ACPI-Compliant System
(ISA) IRQ 84	Microsoft ACPI-Compliant System
(ISA) IRQ 85	Microsoft ACPI-Compliant System
(ISA) IRQ 86	Microsoft ACPI-Compliant System
(ISA) IRQ 87	Microsoft ACPI-Compliant System
(ISA) IRQ 88	Microsoft ACPI-Compliant System
(ISA) IRQ 89	Microsoft ACPI-Compliant System
(ISA) IRQ 90	Microsoft ACPI-Compliant System
(ISA) IRQ 91	Microsoft ACPI-Compliant System
(ISA) IRQ 92	Microsoft ACPI-Compliant System
(ISA) IRQ 93	Microsoft ACPI-Compliant System
(ISA) IRQ 94	Microsoft ACPI-Compliant System
(ISA) IRQ 95	Microsoft ACPI-Compliant System
(ISA) IRQ 96	Microsoft ACPI-Compliant System
(ISA) IRQ 97	Microsoft ACPI-Compliant System
(ISA) IRQ 98	Microsoft ACPI-Compliant System
(ISA) IRQ 99	Microsoft ACPI-Compliant System
(ISA) IRQ 100	Microsoft ACPI-Compliant System
(ISA) IRQ 101	Microsoft ACPI-Compliant System
(ISA) IRQ 102	Microsoft ACPI-Compliant System
(ISA) IRQ 103	Microsoft ACPI-Compliant System
(ISA) IRQ 104	Microsoft ACPI-Compliant System
(ISA) IRQ 105	Microsoft ACPI-Compliant System
(ISA) IRQ 106	Microsoft ACPI-Compliant System
(ISA) IRQ 107	Microsoft ACPI-Compliant System
(ISA) IRQ 108	Microsoft ACPI-Compliant System

IRQ MAP	ASSIGNMENT
(ISA) IRQ 109	Microsoft ACPI-Compliant System
(ISA) IRQ 110	Microsoft ACPI-Compliant System
(ISA) IRQ 111	Microsoft ACPI-Compliant System
(ISA) IRQ 112	Microsoft ACPI-Compliant System
(ISA) IRQ 113	Microsoft ACPI-Compliant System
(ISA) IRQ 114	Microsoft ACPI-Compliant System
(ISA) IRQ 115	Microsoft ACPI-Compliant System
(ISA) IRQ 116	Microsoft ACPI-Compliant System
(ISA) IRQ 117	Microsoft ACPI-Compliant System
(ISA) IRQ 118	Microsoft ACPI-Compliant System
(ISA) IRQ 119	Microsoft ACPI-Compliant System
(ISA) IRQ 120	Microsoft ACPI-Compliant System
(ISA) IRQ 121	Microsoft ACPI-Compliant System
(ISA) IRQ 122	Microsoft ACPI-Compliant System
(ISA) IRQ 123	Microsoft ACPI-Compliant System
(ISA) IRQ 124	Microsoft ACPI-Compliant System
(ISA) IRQ 125	Microsoft ACPI-Compliant System
(ISA) IRQ 126	Microsoft ACPI-Compliant System
(ISA) IRQ 127	Microsoft ACPI-Compliant System
(ISA) IRQ 128	Microsoft ACPI-Compliant System
(ISA) IRQ 129	Microsoft ACPI-Compliant System
(ISA) IRQ 130	Microsoft ACPI-Compliant System
(ISA) IRQ 131	Microsoft ACPI-Compliant System
(ISA) IRQ 132	Microsoft ACPI-Compliant System
(ISA) IRQ 133	Microsoft ACPI-Compliant System
(ISA) IRQ 134	Microsoft ACPI-Compliant System
(ISA) IRQ 135	Microsoft ACPI-Compliant System
(ISA) IRQ 136	Microsoft ACPI-Compliant System
(ISA) IRQ 137	Microsoft ACPI-Compliant System
(ISA) IRQ 138	Microsoft ACPI-Compliant System
(ISA) IRQ 139	Microsoft ACPI-Compliant System
(ISA) IRQ 140	Microsoft ACPI-Compliant System
(ISA) IRQ 141	Microsoft ACPI-Compliant System
(ISA) IRQ 142	Microsoft ACPI-Compliant System
(ISA) IRQ 143	Microsoft ACPI-Compliant System

IRQ MAP	ASSIGNMENT
(ISA) IRQ 144	Microsoft ACPI-Compliant System
(ISA) IRQ 145	Microsoft ACPI-Compliant System
(ISA) IRQ 146	Microsoft ACPI-Compliant System
(ISA) IRQ 147	Microsoft ACPI-Compliant System
(ISA) IRQ 148	Microsoft ACPI-Compliant System
(ISA) IRQ 149	Microsoft ACPI-Compliant System
(ISA) IRQ 150	Microsoft ACPI-Compliant System
(ISA) IRQ 151	Microsoft ACPI-Compliant System
(ISA) IRQ 152	Microsoft ACPI-Compliant System
(ISA) IRQ 153	Microsoft ACPI-Compliant System
(ISA) IRQ 154	Microsoft ACPI-Compliant System
(ISA) IRQ 155	Microsoft ACPI-Compliant System
(ISA) IRQ 156	Microsoft ACPI-Compliant System
(ISA) IRQ 157	Microsoft ACPI-Compliant System
(ISA) IRQ 158	Microsoft ACPI-Compliant System
(ISA) IRQ 159	Microsoft ACPI-Compliant System
(ISA) IRQ 160	Microsoft ACPI-Compliant System
(ISA) IRQ 161	Microsoft ACPI-Compliant System
(ISA) IRQ 162	Microsoft ACPI-Compliant System
(ISA) IRQ 163	Microsoft ACPI-Compliant System
(ISA) IRQ 164	Microsoft ACPI-Compliant System
(ISA) IRQ 165	Microsoft ACPI-Compliant System
(ISA) IRQ 166	Microsoft ACPI-Compliant System
(ISA) IRQ 167	Microsoft ACPI-Compliant System
(ISA) IRQ 168	Microsoft ACPI-Compliant System
(ISA) IRQ 169	Microsoft ACPI-Compliant System
(ISA) IRQ 170	Microsoft ACPI-Compliant System
(ISA) IRQ 171	Microsoft ACPI-Compliant System
(ISA) IRQ 172	Microsoft ACPI-Compliant System
(ISA) IRQ 173	Microsoft ACPI-Compliant System
(ISA) IRQ 174	Microsoft ACPI-Compliant System
(ISA) IRQ 175	Microsoft ACPI-Compliant System
(ISA) IRQ 176	Microsoft ACPI-Compliant System
(ISA) IRQ 177	Microsoft ACPI-Compliant System
(ISA) IRQ 178	Microsoft ACPI-Compliant System

IRQ MAP	ASSIGNMENT
(ISA) IRQ 179	Microsoft ACPI-Compliant System
(ISA) IRQ 180	Microsoft ACPI-Compliant System
(ISA) IRQ 181	Microsoft ACPI-Compliant System
(ISA) IRQ 182	Microsoft ACPI-Compliant System
(ISA) IRQ 183	Microsoft ACPI-Compliant System
(ISA) IRQ 184	Microsoft ACPI-Compliant System
(ISA) IRQ 185	Microsoft ACPI-Compliant System
(ISA) IRQ 186	Microsoft ACPI-Compliant System
(ISA) IRQ 187	Microsoft ACPI-Compliant System
(ISA) IRQ 188	Microsoft ACPI-Compliant System
(ISA) IRQ 189	Microsoft ACPI-Compliant System
(ISA) IRQ 190	Microsoft ACPI-Compliant System
(PCI) IRQ 10	Ethernet Controller
(PCI) IRQ 11	Ethernet Controller
(PCI) IRQ 11	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Trusted Execution Engine Interface - 0F18
(PCI) IRQ 11	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit-SMBus Port - 0F12
(PCI) IRQ 16	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port1 - 0F48
(PCI) IRQ 17	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port2 - 0F4A
(PCI) IRQ 18	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port3 - 0F4C
(PCI) IRQ 19	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
(PCI) IRQ 19	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port4 - 0F4E
(PCI) IRQ 22	High Definition Audio Controller
(PCI) IRQ -3	Intel(R) USB3.0 eXtensible Host Controller
(PCI) IRQ -2	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900

IRQ MAP	ASSIGNMENT
(ISA) IRQ 101	Microsoft ACPI-Compliant System
(ISA) IRQ 102	Microsoft ACPI-Compliant System
(ISA) IRQ 103	Microsoft ACPI-Compliant System
(ISA) IRQ 104	Microsoft ACPI-Compliant System
(ISA) IRQ 105	Microsoft ACPI-Compliant System
(ISA) IRQ 106	Microsoft ACPI-Compliant System
(ISA) IRQ 107	Microsoft ACPI-Compliant System
(ISA) IRQ 108	Microsoft ACPI-Compliant System
(ISA) IRQ 109	Microsoft ACPI-Compliant System
(ISA) IRQ 110	Microsoft ACPI-Compliant System
(ISA) IRQ 111	Microsoft ACPI-Compliant System
(ISA) IRQ 112	Microsoft ACPI-Compliant System
(ISA) IRQ 113	Microsoft ACPI-Compliant System
(ISA) IRQ 114	Microsoft ACPI-Compliant System
(ISA) IRQ 115	Microsoft ACPI-Compliant System
(ISA) IRQ 116	Microsoft ACPI-Compliant System
(ISA) IRQ 117	Microsoft ACPI-Compliant System
(ISA) IRQ 118	Microsoft ACPI-Compliant System
(ISA) IRQ 119	Microsoft ACPI-Compliant System
(ISA) IRQ 120	Microsoft ACPI-Compliant System
(ISA) IRQ 121	Microsoft ACPI-Compliant System
(ISA) IRQ 122	Microsoft ACPI-Compliant System
(ISA) IRQ 123	Microsoft ACPI-Compliant System
(ISA) IRQ 124	Microsoft ACPI-Compliant System
(ISA) IRQ 125	Microsoft ACPI-Compliant System
(ISA) IRQ 126	Microsoft ACPI-Compliant System
(ISA) IRQ 127	Microsoft ACPI-Compliant System
(ISA) IRQ 128	Microsoft ACPI-Compliant System
(ISA) IRQ 129	Microsoft ACPI-Compliant System
(ISA) IRQ 130	Microsoft ACPI-Compliant System

IRQ MAP	ASSIGNMENT
(ISA) IRQ 131	Microsoft ACPI-Compliant System
(ISA) IRQ 132	Microsoft ACPI-Compliant System
(ISA) IRQ 133	Microsoft ACPI-Compliant System
(ISA) IRQ 134	Microsoft ACPI-Compliant System
(ISA) IRQ 135	Microsoft ACPI-Compliant System
(ISA) IRQ 136	Microsoft ACPI-Compliant System
(ISA) IRQ 137	Microsoft ACPI-Compliant System
(ISA) IRQ 138	Microsoft ACPI-Compliant System
(ISA) IRQ 139	Microsoft ACPI-Compliant System
(ISA) IRQ 140	Microsoft ACPI-Compliant System
(ISA) IRQ 141	Microsoft ACPI-Compliant System
(ISA) IRQ 142	Microsoft ACPI-Compliant System
(ISA) IRQ 143	Microsoft ACPI-Compliant System
(ISA) IRQ 144	Microsoft ACPI-Compliant System
(ISA) IRQ 145	Microsoft ACPI-Compliant System
(ISA) IRQ 146	Microsoft ACPI-Compliant System
(ISA) IRQ 147	Microsoft ACPI-Compliant System
(ISA) IRQ 148	Microsoft ACPI-Compliant System
(ISA) IRQ 149	Microsoft ACPI-Compliant System
(ISA) IRQ 150	Microsoft ACPI-Compliant System
(ISA) IRQ 151	Microsoft ACPI-Compliant System
(ISA) IRQ 152	Microsoft ACPI-Compliant System
(ISA) IRQ 153	Microsoft ACPI-Compliant System
(ISA) IRQ 154	Microsoft ACPI-Compliant System
(ISA) IRQ 155	Microsoft ACPI-Compliant System
(ISA) IRQ 156	Microsoft ACPI-Compliant System
(ISA) IRQ 157	Microsoft ACPI-Compliant System
(ISA) IRQ 158	Microsoft ACPI-Compliant System
(ISA) IRQ 159	Microsoft ACPI-Compliant System
(ISA) IRQ 160	Microsoft ACPI-Compliant System
(ISA) IRQ 161	Microsoft ACPI-Compliant System

IRQ MAP	ASSIGNMENT
(ISA) IRQ 162	Microsoft ACPI-Compliant System
(ISA) IRQ 163	Microsoft ACPI-Compliant System
(ISA) IRQ 164	Microsoft ACPI-Compliant System
(ISA) IRQ 165	Microsoft ACPI-Compliant System
(ISA) IRQ 166	Microsoft ACPI-Compliant System
(ISA) IRQ 167	Microsoft ACPI-Compliant System
(ISA) IRQ 168	Microsoft ACPI-Compliant System
(ISA) IRQ 169	Microsoft ACPI-Compliant System
(ISA) IRQ 170	Microsoft ACPI-Compliant System
(ISA) IRQ 171	Microsoft ACPI-Compliant System
(ISA) IRQ 172	Microsoft ACPI-Compliant System
(ISA) IRQ 173	Microsoft ACPI-Compliant System
(ISA) IRQ 174	Microsoft ACPI-Compliant System
(ISA) IRQ 175	Microsoft ACPI-Compliant System
(ISA) IRQ 176	Microsoft ACPI-Compliant System
(ISA) IRQ 177	Microsoft ACPI-Compliant System
(ISA) IRQ 178	Microsoft ACPI-Compliant System
(ISA) IRQ 179	Microsoft ACPI-Compliant System
(ISA) IRQ 180	Microsoft ACPI-Compliant System
(ISA) IRQ 181	Microsoft ACPI-Compliant System
(ISA) IRQ 182	Microsoft ACPI-Compliant System
(ISA) IRQ 183	Microsoft ACPI-Compliant System
(ISA) IRQ 184	Microsoft ACPI-Compliant System
(ISA) IRQ 185	Microsoft ACPI-Compliant System
(ISA) IRQ 186	Microsoft ACPI-Compliant System
(ISA) IRQ 187	Microsoft ACPI-Compliant System
(ISA) IRQ 188	Microsoft ACPI-Compliant System
(ISA) IRQ 189	Microsoft ACPI-Compliant System
(ISA) IRQ 190	Microsoft ACPI-Compliant System
(PCI) IRQ 10	Ethernet Controller
(PCI) IRQ 11	Ethernet Controller

IRQ MAP	ASSIGNMENT
(PCI) IRQ 11	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Trusted Execution Engine Interface - 0F18
(PCI) IRQ 11	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit-SMBus Port - 0F12
(PCI) IRQ 16	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port1 - 0F48
(PCI) IRQ 17	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port2 - 0F4A
(PCI) IRQ 18	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port3 - 0F4C
(PCI) IRQ 19	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
(PCI) IRQ 19	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express - Root Port4 - 0F4E
(PCI) IRQ 22	High Definition Audio Controller
(PCI) IRQ -3	Intel(R) USB3.0 eXtensible Host Controller
(PCI) IRQ -2	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900

Memory Map

MEMORY MAP	ASSIGNMENT
0x000A0000-0x000BFFFF	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0x000A0000-0x000BFFFF	PCI Bus
0x000C0000-0x000DFFFF	PCI Bus
0x000E0000-0x000FFFFF	PCI Bus
0x80000000-0x8FFFFFFF	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0x80000000-0x92216FFE	PCI bus
0x90000000-0x907FFFFF	Ethernet Controller
0x90000000-0x908FFFFF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express -Root Port4 - 0F4E
0x90800000-0x90803FFF	Ethernet Controller
0x91000000-0x917FFFFF	Ethernet Controller
0x91000000-0x918FFFFF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor PCI Express -Root Port3 - 0F4C
0x91800000-0x91803FFF	Ethernet Controller
0x91C0000-0x91FFFFFF	Intel(R) Atom(TM) Processor E3800 Series/Intel(R) Celeron(R) Processor N2920/J1900
0x92000000-0x920FFFFF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Trusted Execution Engine Interface - 0F18
0x92100000-0x921FFFFF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Trusted Execution Engine Interface - 0F18
0x92200000-0x9220FFFF	Intel(R) USB3.0 eXtensible Host Controller
0x92210000-0x92213FFF	High Definition Audio Controller
0x92214000-0x9221401F	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor Platform Control Unit - SMBus Port - 0F12
0x92216000-0x922167FF	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor AHCI - 0F23
0xE0000000-0xEFFFFFFF	Motherboard resources
0xE00000D0-0xE00000DB	Intel(R) Atom(TM)/Celeron(R)/Pentium(R) Processor MBI Device - 33BD
0xFED00000-0xFED003FF	High precision event timer

MEMORY MAP	ASSIGNMENT
0xFED01000-0xFED01FFF	Motherboard resources
0xFED03000-0xFED03FFF	Motherboard resources
0xFED04000-0xFED04FFF	Motherboard resources
0xFED08000-0xFED08FFF	Motherboard resources
0xFED0C000-0xFED0FFFF	Motherboard resources
0xFED1C000-0xFED1CFFF	Motherboard resources
0xFEE00000-0xFEEFFFFF	Motherboard resources
0xFEF00000-0xFEFFFFFF	Motherboard resources
0xFF000000-0xFFFFFFFF	Intel(R) 82802 Firmware Hub Device

Watchdog Timer Configuration

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. User must first assign the address of register by writing address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

Configuration Sequence
To program F81866 configuration registers, the following configuration sequence must be followed:

1. Enter the extended function mode

To place the chip into the Extended Function Mode, two successive writes of 0x87 must be applied to Extended Function Enable Registers (EFERs, i.e. 2Eh or 4Eh).

2. Configure the configuration registers

The chip selects the Logical Device and activates the desired Logical Devices through Extended Function Index Register (EFIR) and Extended Function Data Register (EFDR). The EFIR is located at the same address as the EFER, and the EFDR is located at address (EFIR+1). First, write the Logical Device Number (i.e. 0x07) to the EFIR and then write the number of the desired Logical Device to the EFDR. If accessing the Chip (Global) Control Registers, this step is not required. Secondly, write the address of the desired configuration register within the Logical Device to the EFIR and then write (or read) the desired configuration register through the EFDR.

3. Exit the extended function mode

To exit the Extended Function Mode, writing 0xAA to the EFER is required. Once the chip exits the Extended Function Mode, it is in the normal running mode and is ready to enter the configuration mode.

Example Program

Enable watchdog timer and set 30 sec. as timeout interval

```
;------ Enter to extended function mode ------------------------------------------------------
mov             dx,             2eh
mov             al,             87h
out             dx,             al
out             dx,             al
;------ Select Logical Device 7 of watchdog timer ----------------------------------------
mov             al,             07h
out             dx,             al
inc             dx
mov             al,             07h
out             dx,             al
;------ Enable Watch dog feature ---------------------------------------------------------------
mov             al,             030h
out             dx,             al
inc             dx
mov             al,             01h
out             dx,             al
;------ Enable Watch PME-----------------------------------------------------------------------
dec             dx
mov             al,             0FAh
out             dx,             al
inc             dx
in              al,             dx
and             al,             51h
out             dx,             al
;------ Set second as counting unit
-------------------------------------------------------------
dec             dx
mov             al,             0f5h
out             dx,             al
inc             dx
in              al,             dx
and             al,             30h
out             dx,             al
;------ Set timeout interval as 30seconds and start counting ----------------------------------
dec             dx
mov             al,             0f6h
out             dx,             al
inc             dx
mov             al,             1Eh
```

```
out             dx,             al
;------ Exit the extended function mode ------------------------------------------------------
dec             dx
mov             al,             0aah
out             dx,             al
```

Flash BIOS Update

I. Before System BIOS Update

1. Prepare a bootable media (ex. USB storage device) which can boot system to DOS prompt.
2. Download and save the BIOS file (ex. E9610PM1.bin) to the bootable device.
   - E9611PI1.bin for Intel® 4th Gen. Celeron® E3000 series
   - E9611PM1.bin for Intel® 4th Gen. Atom™ N2000 series
3. Copy AMI flash utility – AFUDOS.exe (V3.03) into bootable device.
4. Make sure the target system can first boot to the bootable device.
   a. Connect the bootable USB device.
   b. Turn on the computer and press <F2> or <Del> key during boot to enter BIOS Setup.
   c. System will go into the BIOS setup menu.
   d. Select [Boot] menu.
   e. Select [Hard Drive BBS Priorities], set the USB bootable device to be the 1st boot device.
   f. Press <F4> key to save configuration and exit the BIOS setup menu.

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Boot
Boot Option #1 [P0: WDC WD10EADS-00...]
Boot Option #2 [JetFlashTranscend 4...]
Sets the system boot order
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

II. AFUDOS Command for System BIOS Update

AFUDOS.exe is the AMI firmware update utility; the command line is shown as below:

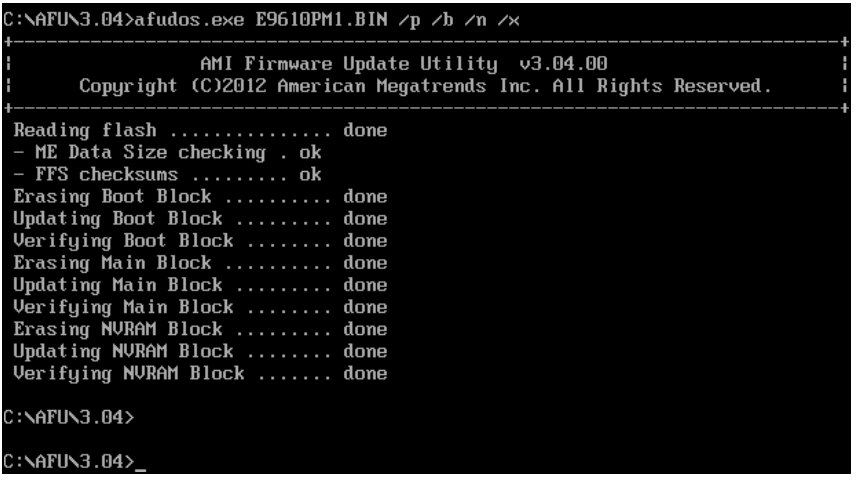
AFUDOS <ROM File Name> [option1] [option2]…

You can type AFUDOS /? to see all the definition of each control options. The recommended options for BIOS ROM update consist of following parameters:

/P: program main BIOS image
/B: program Boot Block
/N: program NVRAM
/X: don't check ROM ID

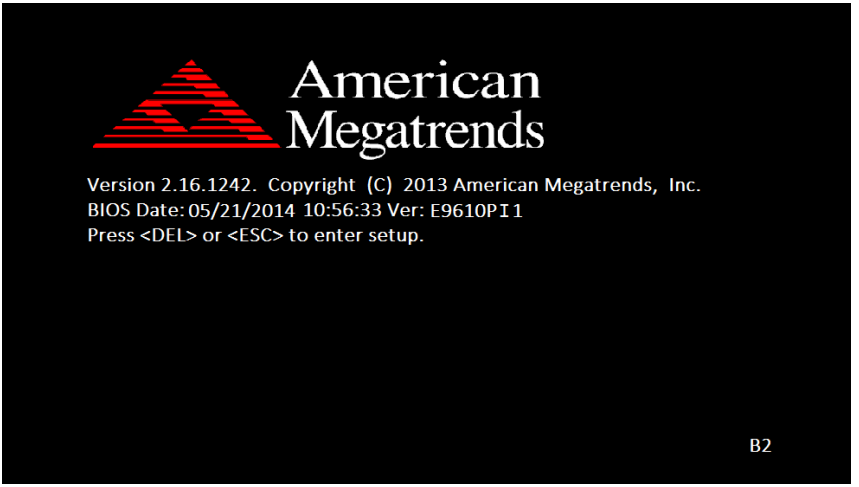
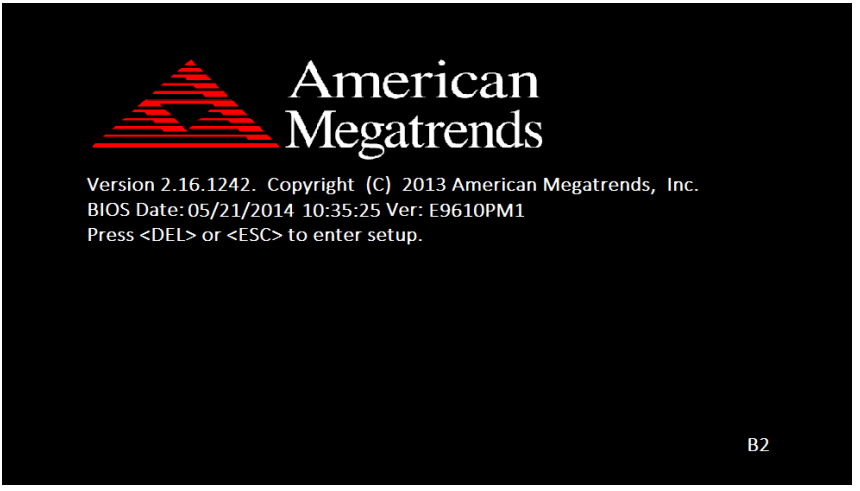
III. BIOS Update Procedure

1. Use the bootable USB device to boot up system into the MS-DOS command prompt.
2. Type in AFUDOS E961xxxx.bin/p/b/n/x and press enter to start the flash procedure.
   Note: xxxx means the BIOS revision part, ex. 0PM1.
3. During the update procedure, you will see the BIOS update process status and its percentage. Beware! Do not turn off system power or reset your computer if the whole procedure are not complete yet, or it may crash the BIOS ROM and make system unable to boot up next time.
4. After the BIOS update procedure is completed, the following messages will be shown:



5. Restart the system and boot up with the new BIOS configurations.
6. The BIOS Update is completed after the system is restarted.
7. Reboot the system and verify if the BIOS version shown on the initialization screen has been updated.

Intel® 4th Gen. Celeron® E3000 series screen:



Intel® 4th Gen. Atom™ N2000 series screen: